

See Parkes - or Cameron's demand. \times gr. = 15.4 grains (1)
Vessels's solution: Litre is 1.76 pint
Cub. C. $\frac{1}{10000}$ of this.

Wilson says, 35 grammes, \times
Cameron , 25 " } potass. iodide

Dissolved in 120 cub. centim. of distilled water

Add strong watery solution of Corros. Sublimate,
stirring, till a very small ^{red} precipitate ceases to
disappear. Filter, then add 120 grammes
caustic soda or 100 grammes potassa, &
~~strong watery solution~~

(Cameron says 100 grammes potassa in
200 cub. centimeters distilled water) - &
then add water to make 500 cub. cent. = $\frac{1}{2}$ litre.

Parkes says: 50 gr. iod. potass. dissolved
in 250 cub. centim. distilled water; reserve a little,
& add to the rest a strong aqueous sol. of Corros.
sub., till a little ^{red} precipitate remains; then add the
reserved part of the sol. pot. iodid., to dissolve precip.
Filter, & add 200 grammes solid potassa dissolved
in water. Dilute to 1 litre, & add 5 cub. cent.
of sat. sol. of Corros. sublimate. Let stand 1 hour &
decant into stoppered bottle. Keep in dark. It has
a pale yellow hue. Will detect 1 part ammonia in 2,000,000 water.
Strong yellow a little; more, deep brown.

Best to Nesslerize by first distilling
; add a little sodium carbonate

the water to be tested. Free ammonia is
thus obtained and estimated. This is
regarded as innocent. The bad quality
of water, from organic matter, is estimated
by the albuminoid ammonia, so called.

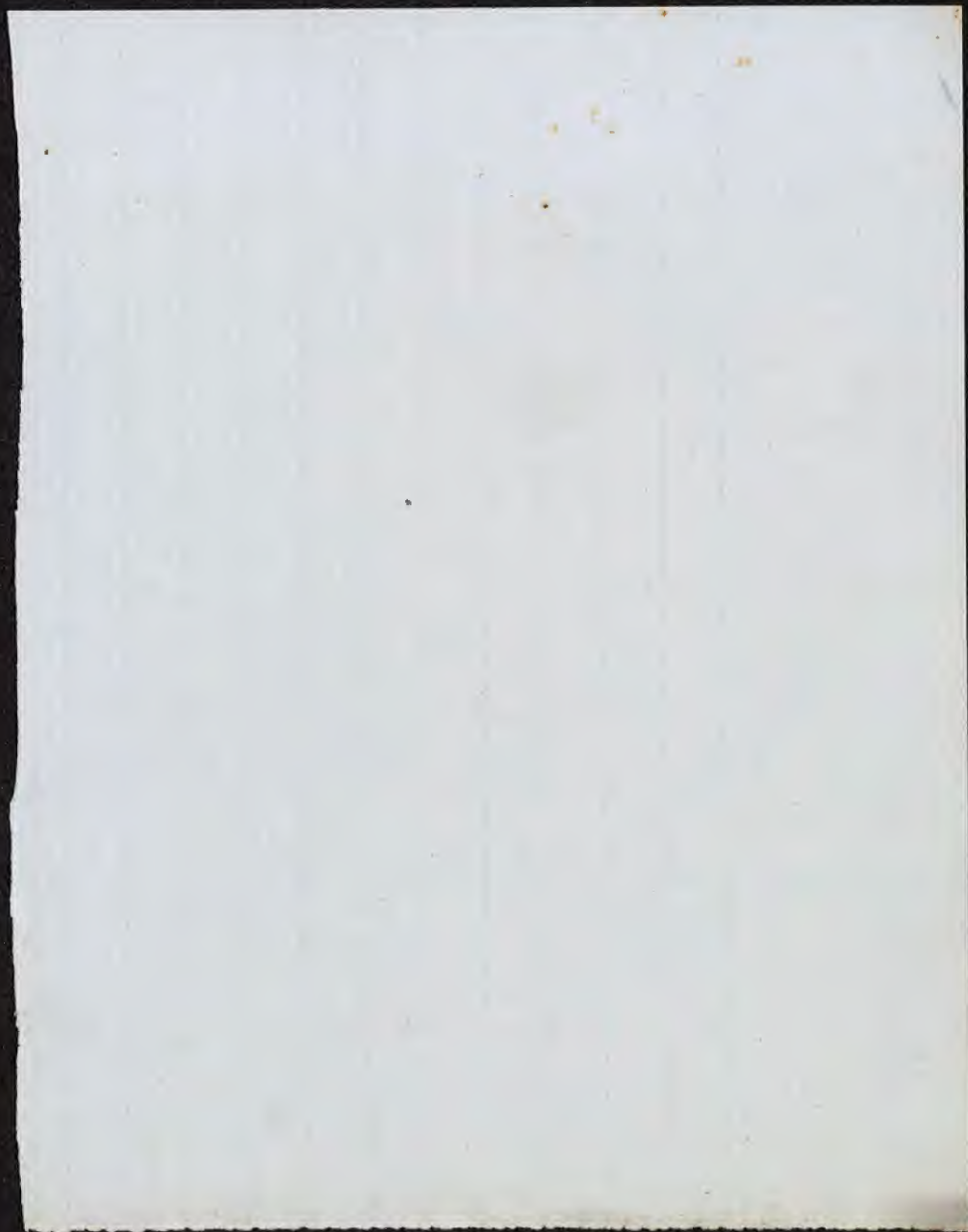
This is tested by boiling a portion
of the water from which the free ammonia
has been sent off by distilling (as above).

~~The~~ boil it with sol. permanganate &
caustic potash. (8 grains permang. with
200 solid grains in 1 liter water), ^{of this sol.} $\frac{1}{10}$ to
the amount tested. — This decomposes the

"albuminoid" or organic nitrogenous
matter, giving off ammonia — now called
albuminoid ammonia. The amount of

this is calculated by Nesslerizing, the
companion of color with a standard solu-
tion of the Nessler liquid with a known amount
of ammonia giving the amount of ammonia
present. $\frac{56}{10,000}$ grain albuminoid ammonia in a
gallon maximum for good water. (Wanklyn).

Dr. Macnair has used
with success in India, a
simpler method: adding at once
to a measured amount of the water to
be tested for nitrogenous matter, the
solution of potassa & potassium perman-
-ganate, then distilling, - & testing by
the Nessler solution the "total ammo-
-nia by one distillation". This avoids
the not altogether certain attempt to
classify the "free ammonia" & "al-
-buminoid ammonia"; & answers
practically quite well. More
entirely reliable exactness in determining
the amount of organic matter in water is
yet ~~consideration~~ among chemists.



THE SANITARIAN.

A MONTHLY JOURNAL.

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No. 39.

THE ORGANIC IMPURITIES OF DRINKING WATER.

On Feb. 17, 1876, Prof. Frankland delivered a discourse to the Fellows of the Chemical Society at Burlington House on the detection and analytical determination of the organic impurities in potable waters. He said that the more his inquiries into the influence of water upon the public health had extended themselves, the more had he become convinced of the great importance of this application of chemical analysis to the community at large, contending that, in the interests of the public health, the bringing to perfection of this branch of analysis was worthy of the greatest efforts of chemists.

The two chief objects to be kept in view in the analysis of potable water are, firstly, the discovery of the evidence of *past* pollution by organic matter; and secondly, the quantitative determination of *present or actual* organic impurity.

The past history of a water is made out chiefly through the mineral products of oxidation which the polluting organic matters have yielded, and which are still present in the water. As these products are innocuous, it is obvious that if all kinds of organic matter behaved alike under the influence of oxidizing agents, such evidence of previous pollution might be safely disregarded; but it is almost superfluous to point out that there are wide differences between various kinds of organic matter in regard to the rapidity with which they combine with oxygen; and of all kinds, that which is organized and living opposes by far the greatest obstacles to oxidation. Now, the researches of Chauveau, Burdon Sanderson, Klein, and others, scarcely leave room for doubt that the specific poisons of the so-called zymotic diseases consist of organized and living organic matter, and it is now certain that water is the medium through which some, at least, of these diseases are propagated. It is evident, therefore, that an amount of exposure to oxidizing influences which may resolve the dead organic matters present in water into innocuous mineral compounds, may, and probably will, fail to affect those constituents which are endowed with life, and Dr. Frankland adduced, as a striking instance of the persistency of the typhoid poison when diffused in water, the outbreak of a violent epidemic of typhoid fever in a Swiss village through the use of spring water which, after contamination with the poison, had filtered through nearly a mile of porous earth, but which had nevertheless lost none of its virulent properties.

As the typhoid poison is always liable to be present in sewage, and as there is no test for it, except its effects upon man, the discovery of previous sewage contamination in potable water ought to be one of the chief objects of the analyst.

The *actual*, or present, as distinguished from the *past*, polluting organic matter of potable water can only be ascertained from the amount of carbon and nitrogen found as constituents of the organic matter present in the water at the time when the analysis is made. The method of performing this operation, known to chemists as the "combustion" method, was fully described to the Fellows of the Society by the speaker eight years ago. Improvements since made were mentioned, and the following proofs of the delicacy and accuracy of the analytical method were adduced:—

To 100,000 parts of a sample of water, rendered as nearly chemically pure as possible, 1·5572 parts of sulphate of quinine were added. The water was then submitted to the method for determining organic carbon and nitrogen just mentioned. The following data compare the quantities of organic carbon and organic nitrogen thus actually added to the water, with those afterwards extracted in each of two analyses:—

	Present.	Found.	
		I.	II.
Organic carbon in 100,000 parts water.....	0·857 part.	0·912	0·904 part.
Organic nitrogen in ditto.....	0·100 "	0·0996	0·098 "

To 100,000 parts of a similar sample of water 0·7786 part of sulphate of quinine was added, and the following results obtained on analysis:—

	Present.	Found.		
		I.	II.	III.
Organic carbon in 100,000 parts of water.....	0·429 part.	0·435	0·442	0·440 part.
Organic nitrogen in ditto.....	0·050 "	0·047	0·048	0·048 "

To 100,000 parts of a third similar sample of pure water 0·07786 part of sulphate of quinine was added. On analysis this water yielded the following numbers:—

	Present.	Found.		
		I.	II.	III.
Organic carbon in 100,000 parts of water.....	0·043 part.	0·047	0·050	0·055 part.
Organic nitrogen in ditto.....	0·005 "	0·006	0·005	0·005 "

The close approximation of the experimental to the calculated numbers is the more striking when it is remembered that the weight of nitrogen *actually determined* in the litre of water used for analysis was, in the last series of experiments, only $\frac{1}{20000}$ th of a gramme.

Applied to actual specimens of potable water, the accuracy of the method was tested by the uniformity of results obtained in the following duplicate analyses of the same samples of water:—

Results of analyses expressed in parts per 100,000.				
		I.	II.	
Thames water as supplied to London.....	Organic carbon	0·280	0·285	part.
	" nitrogen	0·032	0·035	"
River Lea water as supplied to London.....	Organic carbon	0·231	0·239	part.
	" nitrogen	0·042	0·042	"
Kent Company's water as delivered in London	Organic carbon	0·054	0·056	part.
	" nitrogen	0·016	0·017	"

But as practical illustrations of the trustworthiness of the process, the speaker relied most upon the results of the monthly analyses of the water delivered by the eight metropolitan companies made for the Registrar-General during the last eight years, and embodied in two large diagrams which exhibited, at a glance, the results of nearly 800 separate analyses. One of these diagrams showed, by means of curves, the mean proportions of organic elements (organic carbon and organic nitrogen) in the waters of the Thames and Lea, and compared them with that found in the deep well-water of the Kent Company. It also showed the rate of flow of the Thames nearly opposite Hampton Court Palace, and consequently near the place where the Thames water companies abstract their supplies. This diagram showed how sharply the distinction between these three waters is drawn by the method of analysis. In no instance did the curve representing the average organic impurity in the Thames approach near to that indicating the like impurity in the deep-well water, whilst the curve of organic contamination in the Lea water intersected the Thames curve but thrice, and the deep-well curve only once in eight years; and even these intersections, when closely studied, were found to be striking illustrations of the delicacy of the analytical method.

The second diagram might be regarded as a magnified representation of the first. In it the curve representing the average organic impurity in Thames water was decomposed into five constituent curves showing the organic impurity in the water delivered by each of the five metropolitan water companies which abstract their supplies from the Thames; whilst the corresponding curve of impurity in the river Lea was split into two, one representing the impurity in the New River Company's water, and the other that in the beverage delivered by the East London Water Company. As deep-well water is delivered to London by one company only, the curve representing the minute impurity in this water was the same in both diagrams.

These diagrams demonstrated how faithfully the analytical results recorded, firstly, the well-known superiority of deep-well over river water; secondly, the superiority of the water of the Lea to that of the Thames; thirdly, the variations in the three great conditions which govern the intensity of organic contamination in the river waters, viz., heavy floods, small floods when the river is low, and decay of vegetation in autumn; and lastly, the method has shown itself competent to reveal the finer shades of quality in waters drawn simultaneously from the same source, but treated differently by the various companies who manipulate them.

Against these advantages the process of analysis advocated by the speaker involves more trouble and more careful manipulation than are usually bestowed upon what are called "commercial" analyses, and although these drawbacks ought not to be paramount considerations, where such important issues are involved, yet if any other more simple method existed from which trustworthy quantitative information about the organic matter in water could be obtained, the more troublesome process would cease to have a *raison d'être*.

Such a simple alternative method of determining organic nitrogen,

but not organic carbon, is now very extensively used by chemists. It is known as the "albuminoid ammonia" method, and depends upon the fact that by boiling with an alkaline solution of potassic permanganate, most nitrogenous organic bodies are decomposed with evolution of ammonia. From the amount of ammonia so evolved, the proportion of organic nitrogen is calculated. A critical examination of the results obtained by this method conclusively demonstrates that it is incapable of converting into ammonia either the whole, or any definite proportion of the organic nitrogen of potable waters. Indeed, this is shown not only by the following instances, but also by numerous others in which known quantities of nitrogenous organic matters of known composition were submitted to the process.

Results of analysis expressed in parts per 100,000 :—

Artificial Waters containing Peaty Matter.

	Organic nitrogen by combustion.	Organic nitrogen by albuminoid ammonia process.
Sample No. 1.....	·068 part.	·016 part.
" No. 2.....	·042 "	·016 "
" No. 3.....	·076 "	·022 "
" No. 4.....	1·015 "	·308 "
" No. 5.....	1·175 "	·422 "
" No. 6.....	·029 "	·011 "

Natural Waters.

Chelsea Company's water.....	·058 "	·011 "
West Middlesex Company's water....	·027 "	·012 "
Southwark Company's water.....	·061 "	·024 "
Grand Junction water.....	·031 "	·006 "
Lambeth Company's water.....	·062 "	·030 "
Artesian well water.....	·033 "	{ ·003 "
		{ ·004 "
Sea water, No. 1.....	·217 "	·006 "
" No. 2.....	·134 "	·018 "

It is almost superfluous to say that any opinion as to the quality of a sample of water, based upon the albuminoid ammonia obtained, must be entirely untrustworthy.

Dr. Frankland summed up with the following conclusions, to which he had been led by the experiments of himself and others :—

1. That the "albuminoid ammonia" process of analyzing water affords no evidence whatever of the absolute quantity, either of organic matter, or of organic nitrogen present in potable water.

2. That it does not indicate, even approximately, the relative quantities either of organic matter or of organic nitrogen in different samples of such water.

3. That it affords no indication, either of the presence or of the proportion of *albuminoid* as distinguished from other nitrogenous organic compounds.

4. That the "combustion" process, though more troublesome, is the only method at present known which affords any trustworthy information respecting the organic matters present in potable waters.

5. That it is the only method which even professes to determine organic carbon in such waters.

6. That the determinations by it of organic carbon and nitrogen are fairly accurate, notwithstanding the very minute quantities of matter dealt with, and that the errors even of a comparatively inexperienced analyst fall far short of the limits which would affect a verdict upon the quality of the water submitted to investigation.

7. That it is the only process which discloses the proportion of nitrogen to carbon in the organic matter of waters, such information being even of prime importance in reference to the origin of the organic matter.

8. That since the improvements which have been made in the mode of evaporating the water to be analyzed, the process can now be conducted in any laboratory, and with a moderate expenditure of time and labor.—*Nature*.

—:0:—

Froebel's Kindergarten Theories.—A child is social, therefore he must have companions and not be left to the solitude of his home. He is active and fond of making—keep him busy and help him to produce things. He loves the earth—give him a garden patch. He is an artist—give him music, imitative action, and other appropriate means of expression. He is curious—teach him to think and discover. He is religious—lead him to trust in God. On this last he said: "God-trust, rock-firm God-trust has died out of the world. The Kindergarten shall bring it back so that the next generation of children shall be God's children."

Here is work for a child not against the grain, but with it; not in violation of God's law in the child's nature, but in loving obedience to it. Instead of punishing the lad that makes pictures upon his slate, the loving Kindergarten master puts him to making pictures, and gently shows him how to produce with his fingers the pictures that float in his brains. Instead of rebuking his curiosity and constructiveness, the Keilhau schoolmaster yokes them to his purpose. Instead of checking the child's sweetest impulse—the impulse to play—he consecrates it. Jean Paul has said: "Play is the child's first poetry." It was a wise and poetic saying of a poet. But Froebel was not a poet, but a schoolmaster and a philosopher. He went deeper, and said the supreme word about play when he called it the "first work of childhood." It is the child's chief business. Use play to serve the ends of education you may, but to do away with it is the unpardonable sin of the prevalent method of teaching.—E. EGLESTON—*Scribner's for March*.

WHITE CLIFF, TENNESSEE,

AS A MOUNTAIN SANITARIUM AND POPULAR RESORT.

Read before the Knox County Section of the East Tennessee Medical Society,
Feb. 24th, 1876.

BY ALEX. B. TADLOCK, A.M., M.D.

It is estimated that about 600,000 people seek to propitiate the deities of Health and Pleasure by visiting popular sanitary resorts in the United States, at an expense of millions of dollars annually. Indeed, the outlook has been so encouraging, with such flattering inducements for investments in this kind of property, that we have over 2,000 sanitary resorts actually enumerated and now claiming a share of public recognition. These facts sufficiently attest the importance of the subject to the American people, and demand the most earnest attention of sanitarians.

The literature of the subject is not so limited as it is incomplete, and mostly quite barren of detailed, local and experimental data.

The parenthetic clause of our subject, White Cliff, furnishes an example of this neglect which never can be corrected by traditional evidence, though it be ever so abundant and however well authenticated, establishing the salutary advantages of the place as eminently worthy of commendation.

It is not our purpose to recite the traditional narratives, but to remark upon the peculiarities and climatology of the place, in illustration of the generally recognized conditions promotive of health, and which contribute to the control and modification of certain diseases.

The constitutional ability of the human system to tolerate morbid influences and withstand diseased action, determine greatly the vigor, effectiveness and longevity of a people, for such is the adaptability of the human system to even unhealthy places, that by virtue of this power it is enabled to resist toxic agents as a constitutional necessity. We do not mean to intimate that even with exceptionally well-organized society it would be possible to locate beyond the reach of bodily infirmities, but it is certain that places differ greatly in degree of salubrity and the character of prevailing diseases. Medical geography pretty accurately delineates the locality and range of many diseases, whether the cause be exactly understood or not; yellow fever, and malarial diseases generally, are examples.

Consumption, that universal bane, broods over every country, but with very unequal intensity.

The maps compiled for the ninth census of the United States are significant, and highly instructive in showing the distribution of the leading diseases, for which the compilers deserve great credit.

In these maps six shades of color are drawn with marginal explanations, to represent the ratio of deaths from the disease taken to the total mortality of respective places the country over. No. 1 shows the prevalence of consumption. No. 2 locates indisputably malarial

A New Material for Filters.—A report has been made to the Secretary to the Admiralty by Major CREASE, Royal Marines, on the filters at present in use in the Royal Navy. Speaking of the carbon which is at present used as a filtering medium, Major Crease points out that it has one disadvantage—viz., instead of clearing out, it rather affords to the water passed through it, materials which assist in the development of some of the lower organisms. Spongy iron has not this disadvantage, but is slow in its action, and occupies much space in a filter. A newly devised carbonized mineral, which has been called carferal, and which combines carbon, iron, and silicate of alumina, has been experimented upon by analytical chemists, and the results of their examination are stated to be that it has all the advantages of spongy iron and carbon

without any of their drawbacks. The use of carferal is therefore recommended for filters in the Royal Navy.—*Med. Times and Gazette*, Oct. 11, 1879.

uated in tenths of a degree. At its upper end is a small glass ring, through which is passed a strong thread, the ends of which are brought out through a stomach-tube. The upper end of the thermometer is also fastened to the tube by means of a solution of gutta percha. The tube, with the thermometer, is then introduced into the stomach in the same way as the stomach-pump. It has been found by experiment that the thermometer can be introduced into the stomach in from five to ten seconds, and that from fifteen to twenty seconds elapse before the mercury rises. The maximum temperature is reached in four or at most five minutes. If resistance to the passage of the tube be produced by the irritability of the larynx or œsophagus, the thermometer may be cooled by means of ice, which retards the rising of the mercury for a minute and a

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A GREAT IMPROVEMENT IN FILTRATION.

PATENTED JULY 8th, 1873.

We beg leave to call the attention of the public to our new improved WATER FILTER and COOLER COMBINED, the cheapest and only efficient means of filtration ever invented.

The water is filtered through a Porous Block of Pure (Animal) Charcoal, thus combining the highest known chemical power with the greatest mechanical or straining capacity. When this Block becomes foul, it may be taken out, washed and replaced; it will then act as at first. When worn out, a new Block may be obtained, and the Filter becomes equal to new. This may be done at pleasure and without returning it to the makers. This facility for cleansing and renewing is a great advantage over all other Filters now manufactured. The Sand and Sponge Filters are highly dangerous, and ought not to be used; after a little time, from the accumulation and decomposition of impure matter, they become so foul that it were better and safer to drink water unfiltered than to pass it through such Filters. In hot or warm weather, it is obvious that the danger of using such Filters is much increased—the heat fostering the growth of animalcules and insects inside, when once water passed through it has deposited the necessary ovarious particles.

Children are particularly susceptible to the slightest impurity in the Water. The London Times (English), says, "During the last visitation of Cholera, of the total number of 1407 deaths, no less than 573 were Children under 5 years of age. Bad water is a fruitful source of diarrhœa in children. Where cities and towns are supplied from a river, no argument is necessary to show the necessity of filtering water; the practice of running the sewers into the nearest river being, unfortunately, too universal."

The working of the Filter is very simple, and it cannot get out of order; if very impure water is poured into it, an occasional blow through the tube will effectually drive out through the pores of the charcoal any matter that may have settled in it.

We invite the trade and the public generally to call at our wareroom, and be convinced of the superiority of this Filter over all others.

HEALTH PROMOTED

AND

LIFE PROLONGED

BY USING OUR

Pure Carbon Block Filter and Cooler Combined.

PATENTED JULY 8, 1873.



Four Sizes.

No.	Reservoir.	Price.
2	1½ gals.	\$
3	2¼ "	
4	3¼ "	
5	4½ "	



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CRYSTAL SPRING FILTER AND COOLER COMBINED.

FIVE SIZES AS FOLLOWS:

No. 1, Receiver 1 Gallon	1 1/2
No. 2, " " "	2
No. 3, " " "	3
No. 4, " " "	4 1/2
No. 5, " " "	7



PLATED LEVER FAUCET.

GRAINED OAK
AND FURNISHED WITH

Sectional View of Jewett's Patent Crystal Spring Filter.

This Filter will supply a very long felt want of users of Ohio and Mississippi River water as all sand or sediment is deposited where it can be removed. My improvement consists:

FIRST. In sinking a vessel or receptacle in the main and permanent filtering bed, and arranging therein a filtering cup which can be readily removed, cleansed and refilled, through which the liquid is first passed—the grosser particles of foreign matter being intercepted before reaching the main bed, which can thus be used for years without change or renovation.

SECOND. It is evident that by means of my improvement the greater portion of the impurities will be deposited or intercepted in the bottom of the receiver, in the sponge, in the gravel cup, or in the bottom of stationary vessel, which receptacle is provided with small holes near its upper edge for an escape for water into the main filtering bed.

THIRD. The operation—which is as follows: Water being poured into the receiver, a partial deposit takes place at its bottom. The sponge and gravel in the cup will remove the grosser particles of foreign matter contained in the water which passes through the perforated bottom of the cup into the outer stationary vessel, at the bottom of which a further deposit takes place. From the top of this vessel the water flows through the perforations into the **PERMANENT BED**, through which it slowly filters into the reservoir beneath.

FOURTH. A charcoal packed double wall reservoir for Ice and filtered water.

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GRAVELLED CUP

PLATED IRON AND BRASS



2500 LBS. CAPACITY
SOLD BY THE GALLON

Illustration of the Crystal Spring Filter and Cooler

The Crystal Spring Filter and Cooler is a new and improved device for filtering and cooling water. It is made of the finest materials and is designed to last for many years. The filter is made of a fine mesh of wire and is capable of removing all impurities from the water. The cooler is made of a special material which keeps the water cool for many hours. The device is easy to use and is suitable for all kinds of water. It is a perfect filter at last!

The Crystal Spring Filter and Cooler is a new and improved device for filtering and cooling water. It is made of the finest materials and is designed to last for many years. The filter is made of a fine mesh of wire and is capable of removing all impurities from the water. The cooler is made of a special material which keeps the water cool for many hours. The device is easy to use and is suitable for all kinds of water. It is a perfect filter at last!

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HOUSE FURNISHING GOODS

Our savants consider an alga (*desmidea*) or its spores floating in the air, at least as the carrier, if not the prime cause, of infection. Desmids are simple vegetable organizations of vividly green color, graceful shape, and elaborate design. Desmids have in still water a graceful sliding motion of their own, without any perceptible organs of locomotion. They propagate very rapidly, as they multiply by self division as well as by means of spores; conjugation has been frequently observed, and Ehrenberg classified desmids and diatoms among the animalculæ on account of their motion and copulation. One kind of desmideæ produces the foul fishy flavor of water, usually in spring. The water looks fresh and clear on drawing it; after standing a few hours, a film or light cloud makes its appearance, and a close microscopic examination will prove the presence of the "*Ulva intestinalis*" in large quantities. It is not clear that the *ulva int.* is injurious in itself, or whether it is intended as a monitor indicating the presence of organic matter by its repulsive flavor. The probability is that it is infected or tainted by organic or decomposing matter, and consequently is the carrier of disease. The question is naturally open to the inquirer for examination and discussion, and the object of this paragraph is merely to direct attention to this minute object, which is so frequently found in Croton and Ridgewood water, and has called forth so many complaints about their occasional fetid flavor.

LEOPOLD BRANDEIS.

BROOKLYN, March 25th, 1875.

from Sanitarium
May 10 1875

the past year, were much below the predicted losses, leaving a large difference in favor of the company.

ISAAC L. KIP, M. D.

GUSTAVUS S. WINSTON, M. D.

TABLE ABOVE REFERRED TO.

Expected losses by mortality during the year 1874, computed by the company's tables.....	\$2,992,883
Actual loss by mortality, or excess of death-claims over reserve held on the same policies, during the year 1874.....	2,127,749
Difference in favor of the company..	\$865,139
Ratio of actual to expected claims.....	.7102

COMPARISON OF ACTUAL AND EXPECTED MORTALITY FOR 4 YEARS.

Year.	Expected Less Reserve.	Actual Less Reserve.	Saving from Superior Vitality.	A — E
1871	2,373,328	1,851,570	521,757	.7802
1872	2,610,733	1,998,702	612,031	.7656
1873	2,842,402	2,124,284	718,118	.7475
1874	2,992,888	2,127,749	865,138	.7109

THE DURATION OF HUMAN LIFE.

The question whether there are any reliable indications or standard measurements by which to judge of probable lifetimes is one of very

SODA WATER AND SODA FOUNTAINS.

1869
Doctor Clendenin, Health Officer of Cincinnati, has lately made the following report:

To the Honorable, the Board of Health:
~~GENTLEMEN~~—During the summer of 1868, and also during the present summer, several persons complained to me, that they had been made sick by drinking soda water. One person addressed me, anonymously, complaining that he had taken a glass of soda water with a friend, and that within twenty minutes after drinking the water both were taken very sick with vomiting, pain in the stomach, and other alarming symptoms, all of which were attributed by the physicians in attendance to the soda water.

MISCELLANEOUS.

THE IMPROVED
BALTIMORE
Fire-Place Heater,



With ILLUMINATING DOORS and WINDOWS, and
MAGAZINE of sufficient capacity for fuel to last 24
HOURS, at a cost of but 11 CENTS PER DAY. The
most perfect and cheerful Heater in use. Having made
arrangements with

MR. S. B. SEXTON, OF BALTIMORE.

For the EXCLUSIVE manufacturing of these Heaters,
we are prepared to furnish them in large or small quan-
tities.

Sold wholesale or retail.

to their customers. In fountains that have been in use for a long time, the tin lining, by both chemical and mechanical action, is likely to be worn off very thin or removed entirely, leaving the copper exposed to the action of the soda water, the carbonic acid gas of which acts upon the copper and forms a carbonate of copper. It is very probable that during the process of making the carbonic acid gas, and charging the fountains with it, free sulphuric acid, in the form of vapor, may find its way into the fountain. The action of this acid upon the copper would be much more energetic, and more deleterious, than that of carbonic acid.

"I have examined one hundred different specimens of soda water, and in fourteen I found unmistakable evidences of copper, and in ten I found lead also.

"In four different specimens of soda water which I boiled, to expel the carbonic acid gas, a green scum formed on the surface. By evaporating one of these specimens further the metallic scum settled to the bottom of the vessel.

"The amount of metallic copper found in a quart of soda water was a little less than one grain. Dr. Doremus, of New York, states that he has found one grain and a half in a quart of water. Perhaps if my investigations had been conducted more carefully a larger quantity of the poison would have been obtained.

"The amount of copper contained in any soda water would depend upon the length of time the water had been allowed to remain in the fount, to exert its corrosive influence. Of course much would depend upon the completeness of the tin coating.

"I have been informed that soft solder is sometimes used in coating the fountains. This kind of coating is very objectionable, as it is readily acted upon by the carbonic acid gas, forming a carbonate of lead, which is a deleterious substance.

"The pipes used to convey the soda water from the fountain to the jet are, in the great majority of instances, composed of lead; in a few only I found tin pipes. The lead pipe is usually coiled in a tank and covered with ice so as to furnish the draught cool. In some fountains as many as twenty or thirty feet, or more, of lead pipe are used.

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R e m o v a l .

J. T. GALLAGHER

JEWELER,

LATE OF BAILEY & CO.,

"The fountain which seems to be freest from objection is that made of cast iron, lined with enamel; such fountains, however, cannot be transported, but the enameled fountain is to be preferred where it can be used.

"There is no real objection to the tinned copper fountain, provided they are kept properly tinned. The cause of the use of imperfectly tinned fountains is the expensiveness of retinning them, and the difficulty of inspecting their interior. The condenser or fountain should be thoroughly and carefully tinned with pure block tin at least every two years, and wherever there is any doubt as to the condition of the fountain it should be put aside at once and examined by opening and carefully inspecting it.

"It must be borne in mind that the source of the dissolved copper may be either the stop-cock or the cooler, as well as the condenser. The stop-cock is made of brass, and its interior surface should be tinned, yet its interior surface is liable to become exposed. The connection tube between the cooler and drawcock should be silver or pure tin; the tube between the fountain and the cooler should be block tin, or lined with tin. Lead pipes should never be used at all.

"It is a question whether the sale of mineral waters should not be restricted to those who know how to test them, and have the means of doing so; and yet apothecaries are often very careless of their soda fountains, and sell soda water containing the copper solution without knowing it.

"There is no difficulty in ascertaining the condition of soda water. By adding a few drops of the solution of yellow prussiate of potash to a glass of the suspected soda water, placed on white paper, no change is occasioned if it is pure; but if even a small quantity of copper is present, a shade of purplish brown is produced and readily appreciated by looking down into the glass. The presence of lead is readily detected by adding to the suspected liquid a few grains of the iodide of potassium, which, if lead is present, produces a yellow tint.

"These tests should be applied by all who sell soda water, every two or three days, and to every new fountain.

"These facts and suggestions are brought to

BOOTS AND SHOES

FOR GENTLEMEN.

BARTLETT,

33 S. Sixth Street, above Chestnut.

A Good Fit may always be obtained.

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IRON and WIRE RAILINGS, for balconies, offices, cemetery and garden fences.

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914 WHEELER & WILSON'S 914

Sewing Machines,

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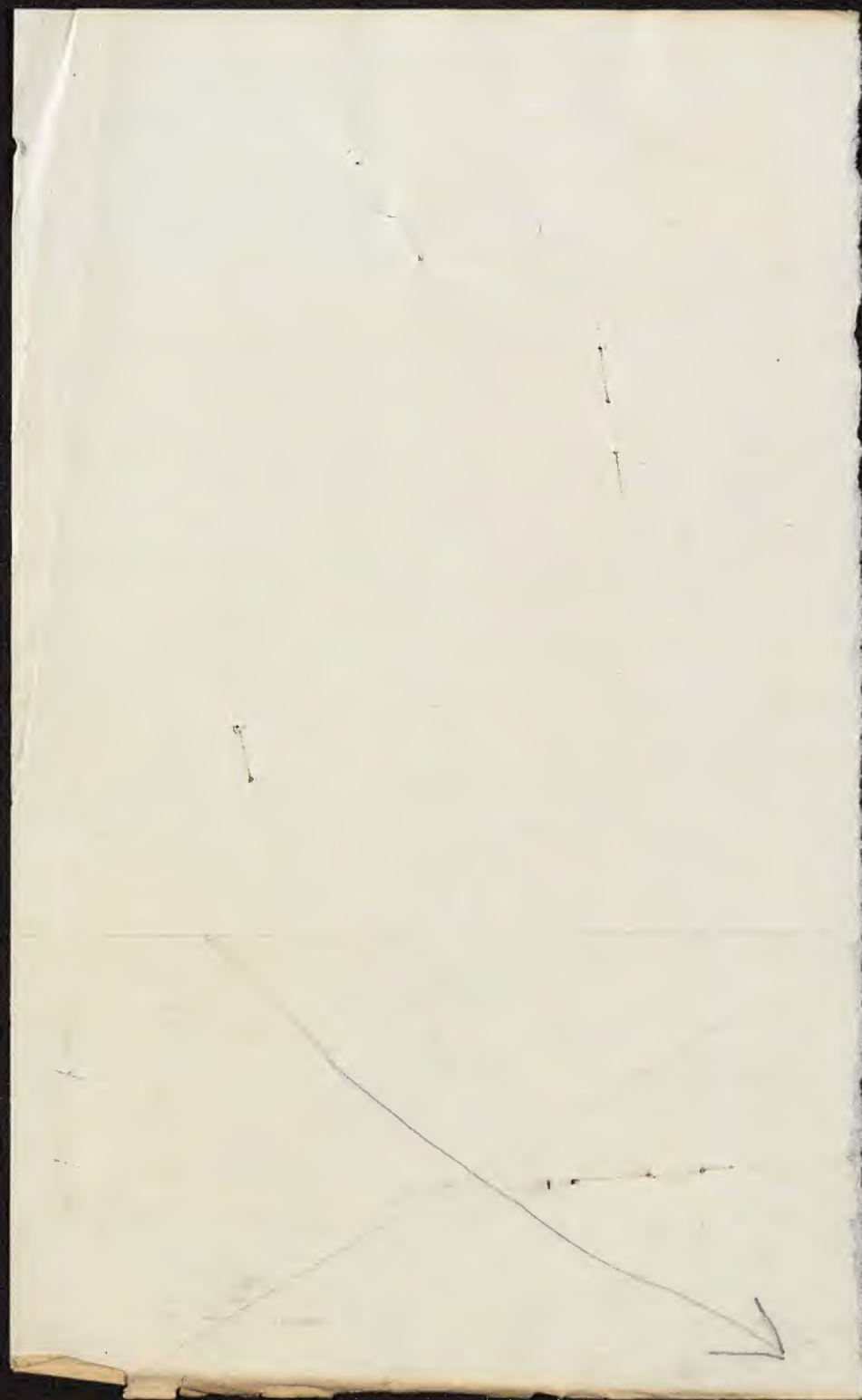
914

914

je26 s tu th 1yrp5

Carbonate of
lead in "first glass"
of soda water from
fountain lead lined.

A manufacturer told
me that the lining of the
metal lasts about 2 years
on the average.



For a few years after the introduction of Croton water into New York, it was remarkably free from metallic salts, although standing a considerable time in lead pipes. This freedom from contamination arose from the presence of lime salts, which were derived from the lime used in the construction of the aqueduct, and prevented the formation of the soluble salts of lead. In course of time the masonry of the aqueduct failed to yield any more lime salts, and the water, being "softer," proved to be active in the formation and solution of metallic salts. It has been stated that one hundredth of a grain of lead in a gallon of water makes a solution capable of producing the toxic effects of that mineral. One tenth of a grain of lead had been found in a gallon of Croton water standing in an ordinary lead supply pipe over night. A gentleman troubled with dyspepsia had been ordered to breakfast daily on wheaten grits. Soon after commencing this treatment, symptoms of lead poisoning were developed, and it was discovered that the cook had been in the habit of preparing the patient's breakfast with water first drawn in the morning from the Croton pipes.

Prof. C. F. Chandler

N. Y. N. Y. :

Sanctuary, May, 75,

Dr. Moreau Morris had heard nothing new either in the paper that had been read or in the remarks which had followed. The principles which had been presented had been laid before the public fully and clearly four or five years ago, at a time when the city was suffering from a fatal epidemic, which evidently had its origin in an almost universal violation of these principles. He believed, however, in the reiteration of these teachings, and was glad that they had been expounded so clearly and forcibly, as a wide spread popular knowledge of these subjects would produce a good effect. He spoke strongly in favor of the ventilation of soil pipes, believing that this was a more important point than the maintenance of impervious traps. The question having been asked whether water could become contaminated from contact with sewer gases, Dr. Morris described the circumstances in which typhoid fever had occurred several years ago in a public institution in the upper part of the island. Out of 500 inmates, 86 or 87 were attacked with typhoid fever, and an official investigation brought to light the following facts. Under the roof of the building were a number of

overflow pipes

pipes - overflow
under the roof -
pipes - overflow

Medical Jurisprudence and Toxicology.

Chronic Lead Poisoning.

Of late the attention of physicians and chemists has been largely drawn to this subject on account of the increasing frequency of its occurrence, and on account of its great importance from a hygienic point of view. Not much that is new has been added to our knowledge of the sources of lead poisoning, but many experiments have been performed which assist in explaining the exact action of the various kinds of water upon lead pipe, and much has been done to discover means of purifying water which has become contaminated with lead compounds, and for substituting innocuous utensils instead of those which contain lead in their composition.

That distilled water when exposed to the air has a very powerful action upon metallic lead is not a new observation. Thus, M. Pierre (*Journal de Pharmacie et de Chimie*, June, 1874) detected $1\frac{1}{2}$ grain of the hydrocarbonate of lead in the distillate collected after passing steam through a coil of lead pipe. Nor is it new, that the presence of certain salts in water modifies this action very greatly. The effect of various saline compounds has been studied at considerable length by M. Fordos (*Journal de Pharmacie et de Chimie*, July, 1874). He finds that in potable waters which contain bicarbonate of calcium, the oxide of lead combines with a part of the carbonic acid, and there results a precipitate of the mixed carbonates of lead and calcium, which adheres to the surface of the lead pipe and prevents further contact of the metal with the water.

In water which contains the sulphate of sodium, the precipitate which results consists of a mixture of the carbonate and sulphate of lead. At the same time the water becomes alkaline to test-paper, and the filtered solution gives a black precipitate with sulphuretted hydrogen. Not only, therefore, has a precipitate of lead-salt formed, but there is also some lead in solution. This is explained in the following way. The oxide of lead, formed by the action of the water, reacts on the sulphate of sodium to form sulphate of lead and hydrate of sodium (liquor sodii); the carbonic acid derived from the air converts the latter into carbonate of sodium, which reacts upon the sulphate of lead to form carbonate of lead and sulphate of sodium again. The sulphate of lead is not absolutely insoluble in alkaline solutions.

With water which contains common salt, the result is analogous, a mixture of the chloride and carbonate of lead being formed. Analogous also is the action of the chloride of ammonium, nitre, and nitrate of ammonium.

The action of water which contains gypsum (sulphate of calcium) upon metallic lead is very slight, a precipitate of the carbonates of lead and calcium being formed upon the surface of the metal, protecting it from further action. If the water contain in addition to the gypsum .001 of common salt, the action upon the lead is much greater. The sulphate of magnesium has the same action as the sulphate of calcium.

It will be seen, therefore, that the presence of alkaline salts in water can render partially soluble those salts of lead which are insoluble in pure water, such as the carbonates and sulphates, and thus partially counteract the beneficial effects of the earthy sulphates and carbonates in preserving the pipe from being further acted upon by the water.

M. Rafard states (*Journal de Chimie Médicale*, November, 1874) that the simple addition of sulphuretted hydrogen is not a sufficiently delicate test for lead in water, since the hydrocarbonate of lead, which is formed by the action of pure water upon lead, and which consists of four equivalents of the oxide of lead, three of carbonic acid, and one of water, often exists in the water in a state of such minute subdivision that it cannot be seen by the unaided eye. In such a water, it is necessary first to dissolve the lead carbonate before it will be blackened by the sulphuretted hydrogen. In order to effect this solution it is only necessary, before adding the sulphuretted hydrogen, to bring the water to boiling, and add a few drops of a solution of tartrate of ammonium, which

over

dissolves those lead compounds which are insoluble in water. If these precautions be adopted, the brown colour of the sulphide of lead can be seen if only very small amounts are present.

To remove lead salts from water, M. Chevallier (*Annales d'Hygiène*, July, 1874) recommends the use of animal charcoal. This method is especially applicable on board vessels to remove salts of lead or copper from the water which is provided for drinking purposes by distillation. In many of the distilling apparatuses, the coil for the condensation of the steam is made of lead or copper, and the water thus condensed always contains a certain amount of the salts of the metal of which the coil is constructed. Many cases are recorded of what is termed "dry colic" among the sailors on board of vessels which are provided with such an apparatus.

Experiments of Lowitz and others have shown that animal charcoal is capable of removing from water not only various organic matters, but also many mineral salts, such as those of lead and copper. The treatment of the water is as follows: To each hectolitre (about 26½ gallons) should be added thirty grammes (about one ounce) of well-washed animal charcoal; the mixture should be well shaken or stirred several times, and then allowed to settle. The supernatant fluid is free from compounds of lead or copper, and is suitable for drinking purposes. Upon the same principle, by using charcoal filters for water which has flowed through lead pipe, tolerable security against lead poisoning can be obtained, if care be taken not to overtax the filters.

It has long been known that one of the fertile sources of chronic lead poisoning is the use of common glazed earthenware dishes for the preservation or cooking of food, especially acid fruits. The glazing of such vessels contains lead, which can be dissolved out by acids. M. Constantin, a chemist in Brest (*Journal de Chimie Médicale*, October, 1874), has invented a new glazing which contains no lead, and should be substituted for the lead glazings. This is made by fusing a mixture of one hundred parts of silicate of sodium, fifteen parts of powdered quartz, and fifteen parts of chalk. To these ingredients may be added ten parts of borax, which renders the glass more fusible, and adds to the brilliancy and durability of the glazing.

In the *Journal de Pharmacie et de Chimie* for August, 1874, is given a report by MM. Bergeron and l'Hôte of an outbreak of lead poisoning in which twenty-six persons were affected. Two of the cases proved fatal. The disease was traced to the presence of lead in brine in which butter was kept. Six specimens were analyzed, and found to contain amounts of the chloride of lead corresponding to from 2.3 to 7.5 grammes of sugar of lead to the litre of brine. Lead was detected in the intestines, liver, and brain of those who died. The existence of lead in the brain in cases of chronic poisoning has been denied by many authors. In the above cases, however, all the proper precautions were taken in performing the analyses, and the metal itself was extracted and weighed, so that there can be no doubt of its existence in that organ in some cases.

Dr. A. Manouvriez (*Recherches cliniques sur l'Intoxication saturnine locale et directe par Absorption cutanée*, Paris, 1874), reports in detail thirty cases of chronic lead poisoning, from the study of which he draws the following conclusions:—

"1. In addition to general and indirect poisoning by digestive and pulmonary absorption, there exists a local and direct intoxication by cutaneous absorption, affecting the parts in immediate contact with the lead.

"2. This local intoxication manifests itself by neuralgic pains both articular and muscular, by cramps, trembling, tingling sensations, sensory and motor paralysis, and atrophy.

"3. This local affection, which in most cases coexists with the general affection, can nevertheless in certain cases exist alone.

"4. These local symptoms can advantageously be combated by local external treatment, and prevented by hygienic precautions which keep the skin from contact with the lead preparation.

"5. The greatest caution is necessary in the employment of medicinal preparations containing lead local applications to the skin."

Of course the few experiments above described do not wholly clear up the difficult and obscure problem of the cause of the action of water on lead, but they at least indicate the great probability of one of the leading causes, and they help to lay at least one old ghost, and lead to a better understanding of some misinterpreted observations. It remains for others to show, if they can, why sulphuric acid or sulphates should be theoretically held to reduce the tendency of water to act on lead when lead sulphate is more soluble than the carbonates, and why free sulphuric acid should be assumed to exist in water simultaneously with metallic chlorides.

* From the *Analyst*.

A H Allen

San. Engineer

Nov. 23, 82

AND RESIDENCES OF BIDDERS.	Sq. yds of Matresses.	Cubic yds of Stone.
Wm. H. Brown, Brooklyn.....	\$0.64 $\frac{3}{4}$	\$3 19
Elton A. Smith and Sam'l J. Whiteside, } Savannah, Ga., }	.63	3.24
A. M. Newton and J. H. Eckstein, } N. Y. City, }	.57	3.35
Eli T. Bangs, Fayetteville, N. Y.....	.57	3.10

CHICAGO.—Commissioner Cregier, of the Public Works, opened bids as follows, Nov. 14: For the setting of eight pumps at the South Branch Pumping Works, Edward Hayden and Wm. D. Cox at \$4,800; Chas. MacMillan at 6,600.

LEAD POISONING FROM THE USE OF METALLIC ICE-PITCHERS.

UNDER the heading, "A Common Source of Lead in Drinking Waters," the *American Chemist* for November gives facts and experiments which prove that the metallic ice-pitchers in common use are often the cause of lead poisoning. The article is an interesting one; but it is not the first time that public attention has been called to the danger of lead contamination from this source. In the BOSTON JOURNAL OF CHEMISTRY for July, 1868, after describing a case of lead poisoning from the use of tin-lined lead pipe, and warning our readers for the second time against the use of such pipe, we added the following remarks:—

"Precisely the same evil is met with in the use of the metallic double-lined ice-water pitchers. The lining of those vessels is often made of dissimilar metals, and the parts joined together with solder into which lead enters as a constituent. Very shortly the thin film of deposited silver is worn off upon the interior; by water contact galvanic action promotes corrosive action, and the water becomes poisonous. Pure water acts much more energetically upon lead and other metals than the ordinary kinds; and hence the action is greatly promoted by the ice-water, which is very nearly as pure as that which is distilled."

The authors of the "Cambridge Course of Physics," having seen the above article, were led to examine the subject for themselves; and the result was that they repeated our warning against these ice-pitchers in their "Hand-book of Chemistry," published in 1868 (page 57), and in the revised edition of their larger work, "Elements of Chemistry," published in 1869 (page 227). So far as we know, these are the only references to the subject in any periodical or any book previous to the appearance of the above-mentioned article in the *American Chemist*.

The latter writer, in closing, quotes M. Guenau de Mussy's remark that "contact, even immediately, between lead and other metals should be avoided in the construction of all reservoirs destined for the conservation of water for domestic use." We would add, "and all pipes for the conveyance of water for such purposes," not excepting the tin-lined lead pipe which our esteemed contemporary advertises in the number containing the article which has suggested these comments.

GALVANIZED IRON WATER-PIPES.

The *Polytechnisches Journal von Dingler*, one of the best scientific periodicals of Europe, asserts that zinc tanks and zinc roofs "invariably and rapidly contaminate water with which they come in contact, by the formation of soluble salts of the metal, which are exceedingly poisonous." It recommends that zinc surfaces thus exposed to the action of water should be covered with a coating of asphalt varnish. The warning and the recommendation are endorsed by the *London Chemical News*, another journal of equally high authority. Of course, the danger from zinc as a coating of iron tanks and pipes is even greater on account of the galvanic action.

In the "Minutes of Evidence taken before the Royal Commission on Water-Supply," in England, we read that Mr. R. Rawlinson testified as follows:—

"Galvanized iron pipes are not to be recommended. They cost forty to fifty per cent. more than plain pipes, and the galvanizing is a delusion. The pipes are laid in subsoils which will act upon iron, the galvanizing affords no protection against that action, and there are soils which will rapidly eat away either iron or lead. If you examine a galvanized iron pipe under a microscope, you will find that it is not an even coating; it is freckled, and there are interstices where oxidation sets up, and then the galvanizing is blistered off; it does not improve, and, even so far as it does cover it, I doubt very much whether it preserves it; it is not stronger in its texture, and it certainly does not last longer; that is my experience."

Prof. A. Matthiessen, in his lecture before the Royal Institution of Great Britain, on "Alloys and their Uses," declares that "no two metals are known which do not dissolve when in combination and acted upon by water."

Dr. Jackson, of Boston, in answer to an inquiry as to the merits of galvanized iron as a material for water-pipes, says, —

(Indos 1288)

ored to disprove this position, and with the plausibility show that the central nucleus of the earth is not composed of molten mineral substances, but that lakes or small seas of lava are distributed throughout her mass. However much disagreement there may be among scientific men regarding the actual condition of the interior of the earth, it is certain that great heat exists below the crust; for, bore where we will, it is found that after the first hundred feet the temperature increases 1° of Fahrenheit for every fifty or sixty feet of descent. Earthquakes and volcanoes have a common origin; and it is safe to say that the recent earthquake was an abortive attempt on the part of Nature to create a new volcano. We have no confidence in Mr. Mackie's theory, that some earthquakes are due to the crystallization of rock masses, under the pressure of superincumbent strata. If some of the denser strata of the earth were ruptured by the sudden slipping of one great rock formation over another, it would not produce that distinct vibratory motion which resembles a huge sea-wave in its physical effects. And, besides, the extent of country over which earthquake motions are felt is unfavorable to the theory. Our little affair in October extended over more than 600,000 square miles of territory in the Northern United States and Canada. Rock masses in crackings and slippings, not produced by the deeper and more potent agencies of heat and perhaps steam, can hardly affect areas so extensive. The enormous strata of rocks are undoubtedly elevated and riven in earthquakes, and it is probable that fissures are formed at greater or less depths, into which intumescent molten matter is instantaneously injected. The late earthquake was probably caused by a movement of pent-up forces at a great depth below; and that no more serious consequences resulted at the surface is due to the disproportion between the force exerted and the resistance of the vast weight of the rocky crust above. Had

of Calabria. Those parts evidently in the earth crust, and they are centres of the volcanic forces, which find vent at points of the least resistance. Taking the whole surface of the earth into account, earthquakes are by no means such rare visitors as many suppose. They occur, according to the most reliable observations, on an average as often as every nine days, and they have a speed varying from six to thirty or forty miles an hour. Mr. Mallet and Prof. Perrey, of Dijon, France, have catalogued six or seven thousand earthquakes, and every year adds largely to the number. We certainly do not desire to have the list swelled by quakings in this section.

A MODEL STEAM-HEATING APPARATUS.

FOR a period of fifteen years we have warmed our dwelling by steam-heat proceeding from apparatus of peculiar construction. It is a device of our own, and one upon which we bestowed a large amount of time and thought. The whole affair is but little larger than a common flour-barrel, and the amount of water employed but three buckets full. It is as portable as a parlor stove, and has not a single pulley, lever, or wheel connected with it; and yet it is perfectly automatic, regulating its own air-draught, steam-pressure, and fuel supply, with unerring accuracy.

Hardly a single instance of disarrangement has occurred for fifteen years; and yet it has been left entirely in the hands of servants to manage. The present autumn we took it apart to ascertain if any repairs were needed. The fire-grate and a portion of the iron-work were replaced at an expense of about fifteen dollars; and with these repairs we can see no reason why it may not faithfully perform its duties for fifteen years longer. It has never consumed a larger amount of coal than six tons during the cold season, commencing in October and ending usually in May. Now let us see what amount of work it performs. It has six radiators connected with it in the rooms above, all of which it is capable of supplying with steam. These radiators warm a hall which is 21 feet long and 8 feet wide, opening up two stories to the attic rooms. Also a parlor 20 by 19 feet and 9 feet high, a sitting-room 15 by 16, sewing-room 12 by 9, and two chambers of equal size with the parlor and sitting-room. It would be difficult to find in any town or city in New England a dwelling

"The iron is protected by the more ready oxidation of the zinc, and the oxide of zinc is largely dissolved by water, rendering it unwholesome. In several instances I have detected large proportions of oxide of zinc in water that has remained over night in galvanized iron pipes; and, in one instance, a gentleman who brought me such water said it produced in him much nausea. The water analyzed was found to be highly charged with oxide of zinc. It is well known that when zinc-covered roofs were first introduced in Boston, and rain-water from them was used for washing, that the washerwomen complained that the water made the skin of their hands crack, and the rain-water from zinc roofs was hard, and decomposed the soap. It is also known that the French government has recently forbidden the use of galvanized iron water-tanks in their ships, on account of the injurious effects of the dissolved zinc on the health of the men."

Dr. Jackson's
9 Boston?

This is but a small part of the testimony that might be added to what we have before given in proof of the dangerous character of this galvanized iron pipe. But while the process pays a profit of a *thousand per cent.* (it costs about half a cent a foot to galvanize pipe which is sold for five cents a foot more than the plain iron pipe), it will find plenty of *disinterested* defenders, who will of course be very ready to insinuate that anybody holding a different opinion is *not* disinterested.

Boston Journal of Chemistry.

JAS. R. NICHOLS, M. D., *Editor.*

WM. J. ROLFE, A. M., *Associate Editor.*

BOSTON, DECEMBER 1, 1870.

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All correspondence relating to the business of the Journal, remittances, etc., must be addressed, "Boston Journal of Chemistry, 150 Congress Street, Boston, Mass."

All correspondence relating to editorial affairs should be addressed to the Editor, 150 Congress Street, Boston.

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Glass Lined Water Pipes.

PATENTED.

PURE WATER AT LAST!

No more Repairs.

The following are some of the advantages of these Pipes:

1. The water coming in contact with nothing but glass, cannot become impregnated with poisonous oxides, as is the case with all metallic pipes in the market.
2. There being no oxidation or corrosion their durability is beyond question, and as the inner surface is perfectly smooth, there can be no friction; consequently the flow of water will be greater and will be carried up in houses with less pressure than through any other pipe of the same diameter.
3. The compressible plastic substance between the iron and glass is a non-conductor of heat and cold; this prevents the water therein from freezing, and, consequently, the pipes from bursting, and keeps the water cooler in summer.
4. Their resisting power is more than five times greater than lead, and exceeds that of any other pipe now in use.
5. The difference in the expansion and contraction of the iron and glass by any change of temperature is overcome by the plastic substance between the two materials.
6. The cost of this pipe is not much higher than lead, and less than tin-lined or block tin pipe. The cost of piping a house with this pipe is the same as for iron gas pipes and less than for either of the other pipes.
7. The great waste of water by keeping it continually running for the sake of purity is obviated, and consequently individuals and corporations are alike protected, and benefited by its general use.
8. This pipe cannot be damaged by rats as lead and tin-lined pipes, which has often been the cause of serious losses by flooding whole stores and houses with water.
9. For conveying chemicals or any liquids, where it is essential that they should be kept free from all impurities and at an even temperature, or where metallic pipes cannot be used unless often replaced, this pipe is especially adapted.
10. It is a fact well known, that quite a percentage of gas escapes through the pores of the iron. When lined with glass this waste is prevented, and the pipes rendered much more durable. **The great expense for continual repairs is almost entirely overcome**, there being nothing liable to break or wear out.

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Office of the Secretary of the Interior

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Received

1876

The Secretary of the Interior

25 years 2
Common
Pipes

We have during this time put into and taken out from wells, springs, and aqueducts thousands of feet of tin and tin-lined pipes, and in no instance within our recollection, where we have seen the interior surface of any of these pipes after a year's use, have we failed to discover more or less corrosion.

Spring and well water seem to act upon the tin quicker than pond or river water.

Hundreds of feet of block tin pipe which we have put into wells we have been called upon to replace with new after ten or twelve years' use, the old pipes being so corroded as to be useless. Portions of some of them we have found to be so completely oxidized as to crumble at the touch, while other portions of the same pipe would be comparatively smooth and free from any corrosion.

Called upon a few days since to make some repairs upon an ordinary house-pump, we had occasion, in taking it down, to cut off the pipe leading to the well, and an examination of this showed it to be tin-lined lead pipe considerably corroded, the tin being completely eaten through, in many places of the size of small shot. Pursuing the investigation still further, we found a short piece of lead pipe (unlined), connected between the tin-lined pipe and the pump, which was perfectly smooth and free from the action of water. The solder joining the two, a mixture of probably nearly equal parts of lead and tin, was also bright and smooth.

The facts ascertained upon inquiry were these:—

Twelve years ago the pump was put in with lead pipe leading to well, and after a lapse of eight years the lead pipe was replaced by the tin-lined, with the exception of the short piece before mentioned, which for some reason was left untouched. Here, then, we have tin and lead under precisely the same conditions of exposure, the former practically useless after four years' use, while the latter was absolutely perfect and uninjured after twelve years' contact with water.

This case, as regards the durability of the lead, we should call exceptional, as most pipes of that metal exposed to the same test would show the action of the water in ten or twelve years.

We never had any reason for supposing that the tin furnished by any manufacturer was anything but commercially pure tin, but it is well-known among plumbers that occasionally a pig of tin is found which will not make good plumbers' solder by reason of the natural impurities contained in it, and our theory of the matter is, that it is these natural impurities existing in both lead and tin pipes which are corroded away by the water from the purer surrounding portions. In no other way can we account for the smooth and sound appearance often found in the same pipe in close proximity to badly corroded portions.

A. M. KNIGHT & SON.

to have its surface bronzed before taking its place wherever may be desired.

During deposition the loss of the copper in the solution must be supplied by hanging little bags of the sulphate of copper crystals in the solution. The zinc in the cell should be taken out and brushed clean once a day, and the dilute acid in the cell should also be replaced once a day. Otherwise little attention is needed beyond looking occasionally to see that the copper growth is proceeding favorably. This may be known by its bright and smooth appearance; if the copper should appear of a hot red tint and sandy texture, the deposition is too rapid. This may arise from the use of too large a zinc surface (as a general rule, it should not be much larger than the mould to be coated), too strong acid, or too short a connecting wire; or, again, the sulphate solution may have been too weak, or the solutions overwarm from the weather or some other cause, and the knowledge of the cause will at once suggest the remedy. No directions can supersede watchfulness and thought on the part of the operator.

The only real difficulty in the process is where there is much undercutting, for the current of electricity does not deposit as freely on surfaces removed from the zinc as on those exactly facing it; it is, therefore, necessary to be certain that these are thoroughly well polished before placing the mould in the depositing jar. If spots should be found uncovered by the copper, the incomplete electrotype may be raised from the solution, washed gently, dried, repolished with plumbago on the bare places, and then put back into the solution.

For joining detached electrotypes into groups it is only requisite to fix them firmly together by means of hot wax, being certain to protect all surfaces that are to be seen in the completed group by a good coating of wax. The mass may then be treated as a common electrotype — the wax which may appear between the copper surfaces at the back of the group well polished, and the exposed copper surfaces made thoroughly clean, and washed with spirit just before placing the mould in the depositing jar. The copper will spread alike over wax and bright copper, and will form the detached pieces, by "galvanic soldering," into one firm piece. For bronzing, use a mixture of sal ammoniac and verdigris dissolved in vinegar. If the electrotype is allowed to stand for a while in this, and then taken out

Corrosion of Tin Pipes

REPORT OF RESULTS OF A SERIES OF EXPERIMENTS

IN REGARD TO THE

Penetration of Frost in Glass-Lined Iron Water Pipe.

It appears, that in this pipe the non-conductive qualities of the glass and of the surrounding cement, which unites it with the iron offer a quite effective resistance to the penetration of frost, which during a slight frost prevents the freezing altogether and even during a severe cold of more than 20 degrees below the freezing point, resists the influence of the cold about five times as long as is the case with purely metallic pipes.

I left Glass-Lined Iron Tubes totally filled with water exposed in my garden during some of the coldest nights in February, 1873, where they sometimes experienced a temperature which my recording thermometer showed to have been near zero, Fahr. and I invariably found the tubes sound in the morning.

The only explanation I am able to give for this unexpected result is, that the smoothness of the pipe inside, admitting an easy sliding motion of the icy crystals over the glass surface, expanding from one spot in a longitudinal direction, has the advantage over a tube with a rough interior surface, in which the ice crystals will adhere, the longitudinal expansion prevented, and the transverse expansion finally bursts the tube, the ice particles being more firmly caught on the inside.

P. H. VAN DER WEYDE, M. D.

Editor of the Manufacturer and Builder,

*Late Professor of Chemistry, N.-Y. Med. College, Cooper Institute, N.-Y.,
and Girard College, Philadelphia, Pa., &c.*

NEW-YORK, February 22, 1873.

Report of the Sanitary Committee.

TO THE BOARD OF HEALTH.

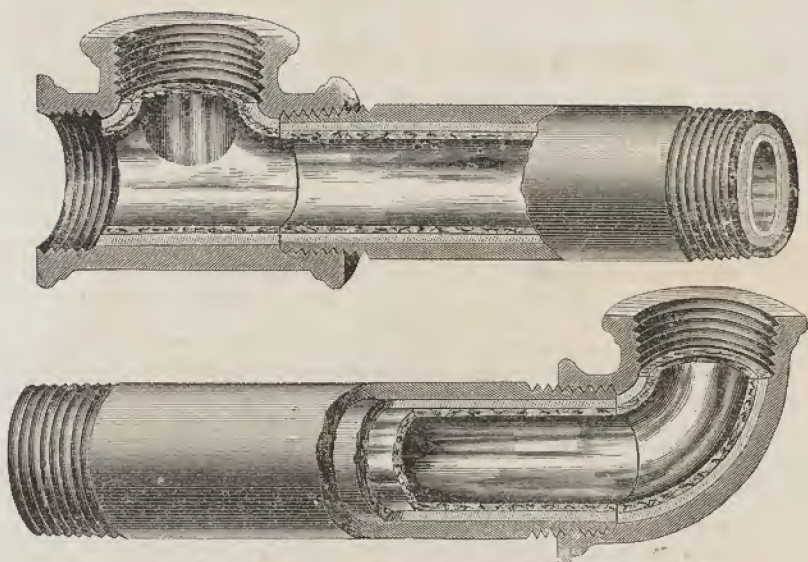
The within communication from the President of the Glass-Lined Pipe and Tube Company, having been addressed to the Sanitary Committee, the latter on examination of the samples of tubes submitted to them, feel justified in calling the attention of the Board to this really important and welcome improvement in the mode of conducting water into dwellings and public buildings. The glass-tube inserted into an iron pipe lined with a filling of plaster paris and this, again, protected by cement against infiltration of water present a combination answering all sanitary requirements as well as the demands of comfort and cleanliness.

Respectfully submitted,

G. PECCARINI, M. D.

Chairman San. Committee.

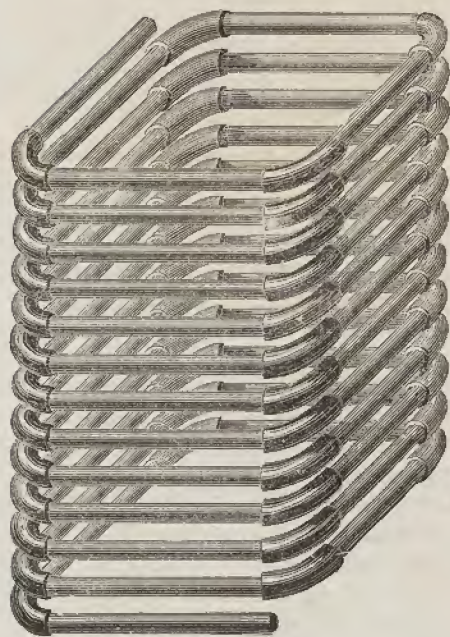
NEW-YORK, March 25, 1873.



GLASS-LINED IRON PIPE AND FITTINGS (ELBOWS AND TEES)

FOR

Water, Gas and other purposes.



COIL OF GLASS-LINED IRON PIPE

FOR

Soda Water, Beer, Liquors, Acids, Chemicals, &c.

Our celebrated Beer-Cooler, Price from \$12 to \$16.

Manufactured by the Glass-Lined Pipe and Tube Company of the State of New-York.

All Orders promptly attended to.

WM. RADDE, President, No. 548 Pearl-St., New-York.

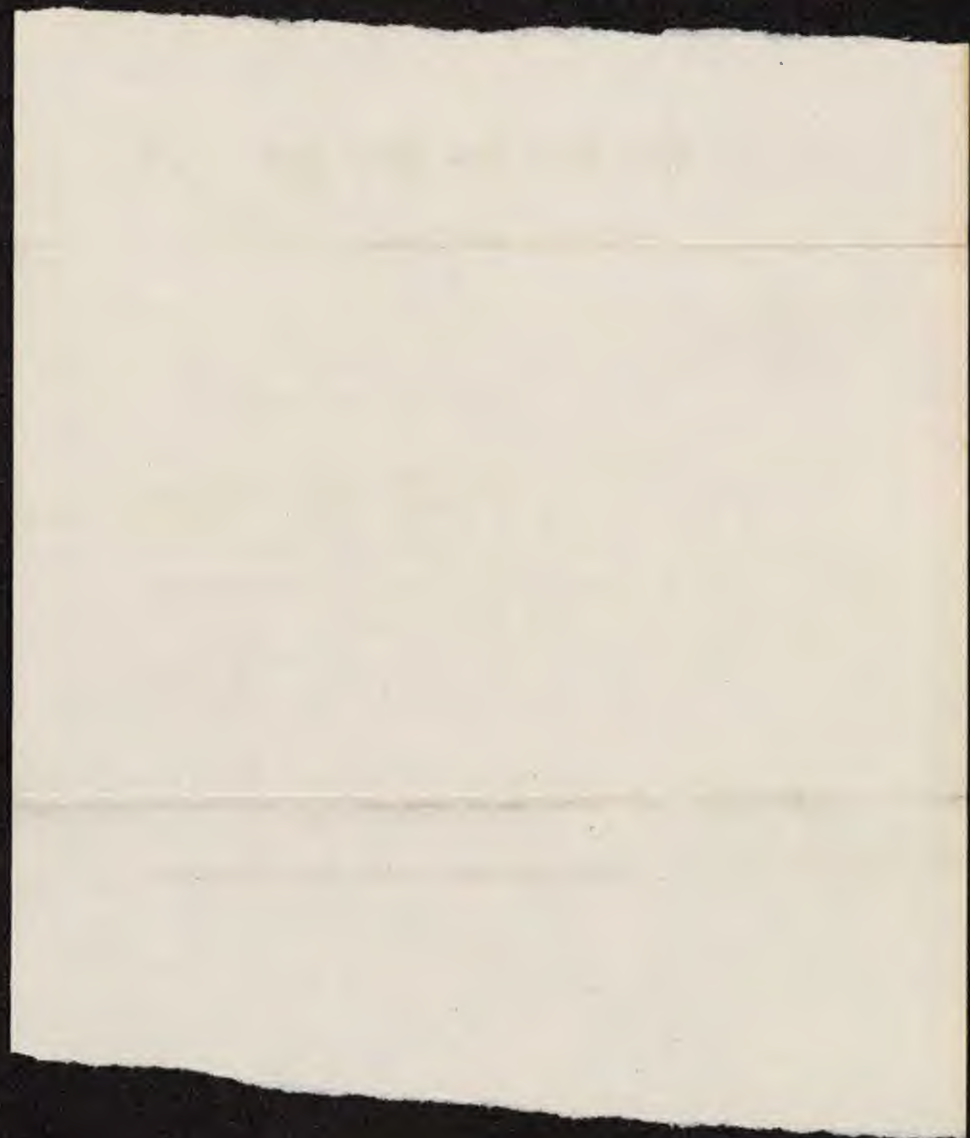
Glass-Lined Iron Water Pipe.

NEW-YORK, MARCH 31ST, 1874.

My view on the usefulness of this kind of pipe for plumbing purposes, from all I know of it, is that I would prefer it to any other if I were building a house. Its sanitary advantages are sufficient to induce me to recommend it whenever an opportunity offers.

CARL PFEIFFER,

Consulting Sanitary Architect, Health Department.



ON THE CAUSE AND PREVENTION OF TYPHOID FEVER IN SCHOOLS.

BY JOHN L. LECONTE, M.D.,

Late Medical Inspector U.S.A.

IN the beginning of January, 1875, I was requested to inspect St. Mary's Hall, Burlington, N.J. (a justly renowned school for the education of young ladies), in order to ascertain the cause of an outbreak of typhoid disease which had occurred some weeks before.

The cause, as is usual in such cases, was easily discovered, and the means for its removal and for the prevention of its recurrence readily determined. The suggestions which I made have been fully carried out by the trustees, and I in consequence gave a certificate stating that the necessary sanitary improvements had been made, and that there was no danger of a recurrence of typhoid disease.

These facts having come to the knowledge of several friends who are interested in sanitary science, I have been requested by them to prepare a short account of the causes which led to the development of the disease, and the results of the measures adopted for its suppression.

By the kind permission of the Board of Trustees of the school, I am now authorized to do this, and I hope that the lesson conveyed by these very simple observations will not be lost upon other institutions which are liable to similar misfortunes.

At the time that the hall was built, the water-supply was obtained from two cisterns, constructed of heavy wooden curbs, lined with brick and coated with cement. They were floored with timber, and descended below the level of subterranean drainage, by which spring-water would enter. In order to place the floor properly, a hole was cut in each to prevent the pressure of the spring-water. After the timber floor was fixed permanently, these holes were plugged, the plugs rising above the masonry bottom of the cistern. The water-supply was thus made to depend entirely upon the river; and had these arrangements continued without change I am

confident that no typhoid disease would have occurred.

A year later, without the knowledge of the authorities of the school, the plugs at the bottom of the cisterns were removed. This was a capital error, but would, perhaps, have been insignificant in its results had it not been supplemented by a second, the pernicious effects of which recently manifested themselves. A year or eighteen months afterwards (1871), privy-vaults were dug outside of the building for the reception of the excreta, which up to that time were received in boxes and removed every few days.

One of these privy-vaults was most inconsiderately placed about eight or twelve feet from the water-cisterns, which, as is mentioned above, had been opened to the influence of subterranean drainage. This privy vault seems to have been constructed with all the care usually exercised in the building of such receptacles,—bottom and sides nine-inch brick, laid in cement, heavily and carefully covered with cement, and arched over above.

The result was naturally what any student of sanitary science would have predicted. After a certain lapse of time (in this instance three years) the soil around the privy-vault became poisoned with the effluvia and infiltrations, and the water-supply in the cisterns thus became contaminated.

Having thus ascertained the cause of the disease, the remedy was, of course, evident, and of easy application. I was glad to find that it had been already recommended by the physicians of the establishment, Drs. Pugh and Gauntt, who, with admirable judgment, had, on the 18th of December, 1874, advised the disuse of the cisterns. It is a significant fact, as showing the correctness of my view that the contiguity of the privy-vault to the cisterns was the *sole cause* of the disease, that ten days after the water had been, by the advice of the physicians, drawn directly from the river, the last case of typhoid fever occurred, and since that time (28th of December) the school has been quite free from all similar disease.

One or two interesting facts were developed during my examination, which are worthy of mention. Although numerous cases of typhoid occurred among the girls, and a smaller proportion among the teachers, *not a single one* of the servants was affected. On inquiring of the latter whether they drank water, the reply was that they used only tea and coffee, and almost never drank between meals. The girls, on the contrary, like all children, are frequently thirsty, and drink often at intermediate hours of the day. The water consumed by the servants was, therefore, boiled, by which process the molecular activity of the putrescent matter was checked, and its power as a zymos was destroyed. No more admirable instance of the efficacy of this simple remedy for the purification of contaminated water can be found.

I asked the Rev. E. K. Smith, D.D., the principal of the school, what had been the fate of those pupils who did not use tea, coffee, or milk, but drank water exclusively. He told me that, after careful inquiry at the different tables in the refec-

tion, he ascertained that 17 of these had typhoid fever.

*30 cases
typhoid
in about
2 weeks*

tory, he ascertained that of seven absolute water-drinkers six had been attacked with typhoid.

In conclusion, I would invite the attention of my colleagues in the medical profession, and the governing authorities of schools, both public and private, to the ease with which all similar outbreaks of disease may be prevented, or, as in the present instance, speedily removed, by seeking scientific advice.

The following recommendations, if adopted, would, in most cases, prove effective.

1. Before the plans of the building are fully matured, let an expert in sanitary studies be employed to give directions to the architect in all that relates to ventilation, drainage, and water-supply.

2. After the building is completed, no alterations should be made affecting these three essentials of good hygienic condition, without the suggestion of a practised sanitarian.

3. There should be stated inspections, say twice a year, of each institution by some sanitarian of acknowledged merit, who, after close examination and the correction of any defect, would give a certificate to be published in the circular or announcements of the school.

4. On the outbreak of any zymotic disease in the institution, the advice of a sanitarian expert should at once be obtained, in order that means may be taken for its restriction, suppression, and prevention.

I may be permitted to add that at the last visit I made to St. Mary's Hall I found the sanitary condition perfect; and I cannot too highly commend the liberal manner in which the trustees have carried out the suggestions contained in my report, thus insuring, in my opinion, the health of the scholars confided to their care.

TRANSLATIONS.

CASE OF HYPERHIDROSIS UNILATERALIS.—Dr. Pokroffsky reports (*Berlin. Klin. Wochen.*, No. 13, 1875) the following case, which presented itself recently at Prof. Botkin's clinic in St. Petersburg. The patient, a man, presented the following appearances whenever he began to eat. The right side of the face, the greater part of the forehead, a part of the region about the shoulder, and the entire neighborhood of the temple, the ear, a little strip behind the ear, and the upper part of the neck on the right side, became decidedly red and covered with profuse perspiration. This collected gradually in large drops, and if not wiped away would run down over the body. The right half of the breast, the right arm and leg, were, during eating, somewhat warmer and more moist than the same parts on the left side. During the perspiration the right temporal artery became prominent, and pulsated markedly. Pulsation was noticeable also on the inner surface of the cheek. The pupils contracted equally; there was slight asymmetry of the face and tongue; the right eyelid could not be raised quite as high as the left.

During eating the temperature rose 0.2° to 0.4° , centigrade, in the right armpit, and other variations showed themselves later. Irritation of the sympathetic by the induced current during the patient's quiescence produced no effect similar to that brought on by eating;

When the penis was erect it was invisible while the thighs were closed, but when these were opened it could be seen pointing backwards. This resulted from the fact that the prepuce was closely attached to the scrotum. It lay in the raphe of the scrotum, not like a protuberance from the latter, but embedded in it, and, in fact, in such a manner that the frænulum was fastened to the skin of the scrotal juncture and to that of the perineum. The normal and erectile glans was quite free. The individual in question admitted having twice completed coitus.—*Centralblatt*, No. 16, 1875.

X.

VARIOUS METHODS OF TREATING WOUNDS.—The *Centralblatt für Chirurgie*, April 24, contains abstracts of papers on this subject by various writers, whose views are essentially as follows:

Dr. Ollier (*Comptes-Rendus*, tom. lxxx., 1875) recommends dressings of cotton with immovable occlusion. He says that although, when the wadding is removed, quantities of vibriones and other low organisms are discovered in the discharges, yet no evil comes of this.

The same pus, however, injected into the cellular tissue of a dog brought about gangrenous phlegmons. This shows how tolerant the surface of the wound becomes to the presence of this pus. Should daily removal and cleansing of the wound be practised, some fine granulations must almost inevitably become denuded, and an absorbing surface for the pus be made.

This explains the rise of temperature which follows each renewal of the dressing when this is frequently carried out. On the other hand, if the immovable and occlusive wadding bandage be retained in position until it has to be removed on account of the accumulation of purulent matter, the temperature of the patient will fall after the dressing is changed. Ollier has had remarkable success with the immobile and occluded dressings, and believes them the most appropriate in severe wounds, etc., and also that erysipelas is not so frequently met with.

Marc Sée (*Rev. de Thérap.*, 1875, No. 2) uses irrigation by means of weak alcohol. Wounds treated in this way take on new action, and, although proud flesh is apt to show itself, laudable pus makes its appearance, and the wound thus treated rapidly assumes a healthy granulation, and tends towards rapid recovery.

Nussbaum (*Aertzl. Intelligenzblatt*, 1875, No. 5) gives statistics from the surgical clinic at Munich, in support of Lister's method of treating wounds. Its figures certainly show a marked falling off of mortality subsequent to the use of salicylic acid.

X.

Dr. Charles A. Cameron, Medical Officer of Health of Pembroke township, and Analyst for the city of Dublin, etc., in his "Report on Public Health," published Nov. 1873, sums up "seven additional recorded instances in which typhoid fever was spread through the medium of milk, namely, at Penrith, Islington, Leeds (on two occasions), Parkhead, Chester, and Edinburgh." During our recent epidemic of smallpox, infection appeared in some cases to have been conveyed in this way. Scarlet fever has been distinctly traced to this source.

*No quoted by
Dr. B. Leach
in a report to
Public Health Sec.*

referred to the practice of the daily baths, with reg-

mode of cleansing foul apartments, and of using disinfectants, is undoubtedly due the fact that even the ordinary bowel affections, diarrhœa, summer cholera and cholera morbus, were so infrequent and so light. During the late summer and autumn, a mild form of hepatic congestion, usually accompanied by diarrhœa, prevailed quite extensively. It was usually attributed to malarial influence, and was quite amenable to a course of treatment based upon that supposition.

A mild type of

For the purpose of scenting black teas, certain kinds of flowers are used; being previously dried and powdered, they are sprinkled over the tea before it undergoes the last process of roasting. Souchong tea is sometimes scented with the flowers of *gardenia Florida*, *olea fragrans*, and *jasminum sabac*.

The principal adulterations of black tea consist in the addition of leaves not belonging to the tea plant, and in the fraudulent conversion of exhausted tea leaves into the apparently genuine article. The Chinese frequently use the leaves of the *camellia sasanqua* and *chloranthus inconspicuus* in their manufacture of tea; and, according to Dr. Dixon, many millions of pounds of the leaves of various plants are dried annually to mingle with genuine tea, as those of the ash, plane, &c. It has also been ascertained that the leaves of several British plants are often used for the adulteration of tea, as those of the beech, elm, horse chestnut, plane, bastard plane, fancy oak, willow, poplar, hawthorn, and sloe. The leaves are dried, broken up into pieces, and usually mixed with a paste made of gum and catechu; afterwards they are ground and reduced to a powder, which, being colored with rose pink, is mixed either with dust of genuine tea or with inferior descriptions of black tea. The chemical properties of the leaves may, besides their physical structure, help to detect their nature. Thus the prune tribe of plants, including sloe, cherry, laurel, &c., the seeds of which yield prussic acid, all contain amygdaline, or some similar principle. All of these, when oxidized with sulphuric acid and peroxide of manganese, give oil of bitter-almonds, and can be thus recognized. The willow and poplar tribe yield oil of spirea ulmeria (salicylous acid), to say the least, a very characteristic substance.

The following may be briefly summed up as the adulterants frequently used in the manufacture of black teas: Catechu, or Japan earth; La Veno Bone, a bitter, red-

Several towns in the interior suffered severely in the loss of life and property. At Camac, on the Georgia Railroad, several houses were blown down. Thomas Geesling was killed and several persons were wounded. Near Thomson, forty-six miles from Augusta, a large amount of property was destroyed and several persons killed. At Appling, in Columbia county, the destruction to property is reported to be great. Several persons are reported killed and many wounded. At Aiken, S. C., the Catholic church was completely demolished. All telegraph lines North but one are down. The reports from the country are confused and unsatisfactory as to the extent of damage and the number of lives lost, but there seems to be no doubt that the storm was fearfully destructive, surpassing in extent and violence anything of the kind in this section for years.

LATER—DAMAGE IN OTHER DIRECTIONS.

AUGUSTA, Ga., March 21. — The tornado caused fearful destruction along its track, laying waste houses, trees, and fences, and killing persons and stock. The Baptists were holding a meeting at Elam Church, near Camac, when the storm demolished it, killing three and wounding twenty-five persons. Residences and outhouses were demolished upon many of the plantations in Warren, McDuffie, and Columbia counties, in Georgia, the destruction extending into Edgefield, Aiken, and Barnwell counties in South Carolina. In some places persons were blown a distance of sixty yards. Every house on Mrs. P. E. Walton's plantation, including her fine residence, was destroyed. In Columbia county three negroes were killed and twenty-five persons wounded. Ten houses on Dr. Hamilton's place were destroyed. It is impossible to give a correct idea of the amount of property lost; several hundred thousand dollars will not cover it. Fearful suffering is already reported in the devastated territory, it being the severest storm ever known in this section.

dish-brown-colored powder; Chinese botanical powder; gum and starch, sulphate of iron, rosepink, logwood; graphite, plumbago, or black lead; tale; China-clay, or soapstone; indigo, and turmeric powder.

Green Tans



CAFFEINE.

This alkaloid is called *caffeine*, *theine*, and by modern chemists, *methyltheobromine*; its chemical composition is represented by the formula $C_8H_{10}N_4O_2$. It can be obtained by adding basic acetate of lead to a strong infusion of tea or coffee, filtering, removing the excess of lead with sulphide of hydrogen, and allowing the caffeine to crystallize out. A German chemist, named Aubert, has recently been experimenting with coffee, and finds that by dissolving out the alkaloid with chloroform, he obtains as much as 0.7 to 0.8 per cent. of caffeine from the green bean. Tea contains as much as 6 per cent. It is insoluble in concentrated carbonate of potash, and can be precipitated by it from an infusion of tea, after removing the tannin with acetate of lead.

A cup of "good" coffee made from half an ounce of ground coffee, contains as much caffeine as a cup of "good" tea made from 5 or 6 grains of tea leaves, and no more. In both cases there is 0.1 to 0.12 of a grain of caffeine; so that tea drinkers take no less of this poison into the system than coffee drinkers.

CAFFEINE A POISON.

According to Aubert, caffeine resembles strychnine in its physiological effects, producing, in large doses, increased excitability and rigid spasms. It acts directly on the spinal marrow, by irritating which it occasions the above symptoms. A further resemblance to strychnine consists in the fact, that animals poisoned with it do not show these symptoms equally, if artificial respiration is kept up. With caffeine, keeping up artificial respiration for five minutes suffices to render a large dose of the poison harmless.

It is ~~not yet~~ ^{not} certain ~~whether~~ ^{that} the effects produced by the use of coffee as a beverage are due to the amount of caffeine it contains. Decoc-tions of coffee free from caffeine also produce violent symptoms in animals, but quite different from those of caffeine.

TEST FOR CAFFEINE.

If an aqueous solution of caffeine be evaporated to dryness in a sand bath, a few drops of chlorine water added, and again dried, a blood-red residue will be obtained. In this way 1-1000th of caffeine can be detected.

Saxons, and Danes, and also in more recent times; magnificent caverns, rich in spars, stalactites, and fossils; and the famous "Petrifying Wells," which we have taken as the subject of this brief paper.

These "wells" are formed by little streams that trickle from the rocks, and everything over which the water flows is gradually turned to stone; that is, it is either petrified, in the ordinary acceptation of the term, or is encrusted with stone, so that it is preserved from decay, like the insects inclosed in amber. The water is highly charged with carbonate of lime, a portion of which is deposited as the water evaporates on exposure to the air, forming a film of the mineral on the surface over which it flows. If the material is porous, like wood, the water is absorbed, and the lime-salt is deposited within the cells, until at last the whole texture of the body becomes of the consistence of stone; otherwise, the surface merely acquires a varnish of limestone, the thickness of which will depend upon the length of time it is subjected to the action of the water. The wells are always full of things to be petrified, and the average time taken for the process is about a year. Birds' nests and eggs are favorite objects for the treatment; so are plants, especially mosses, and also baskets, and many other pretty things made by hand. Not a few of these have been brought from a great distance, even from Canada and Australia, as tokens of affection, or mementoes of the loved

of beauty."

have had the pleasure of listening to Prof. Tyndall in the cities of New York and Philadelphia. But to such as do not enjoy that privilege a brief résumé of his lectures may be of interest. To give anything like a full account of the many and beautiful experiments that delighted and instructed his Boston audience would fill many pages of our journal.

The course of six lectures was wholly upon light, with the exception of one or two experiments in the last lecture. The Professor commenced by explaining the source of light that he intended to use in his experiments. He first showed that dynamic electricity could be easily converted into heat. A platinum wire five or six feet long, introduced into the circuit of his battery, was heated to intense whiteness, and finally a shorter piece was fused. A piece of

COFFEE AND MILK.

SEVERAL years ago, a foreign chemist — a German, if we remember right — advanced the theory that coffee is not often injurious unless taken with milk. Of course, there are exceptional cases in which it does not agree with a person in any form, but as a rule it is its combination with milk that troubles the digestive organs. There may be some grounds for this opinion. We have known of at least two persons who were obliged to give up the use of coffee, which they had always taken with milk, and who were led to try the experiment of drinking it without milk. After using the *café noir* for a year or more they find that it agrees with them perfectly, but a single cup of *café au lait* brings back the old digestive difficulties.

We refer to these cases because we see that M. Marchand, a chemist of Fécamp, has recently come to a similar conclusion concerning the mixture of coffee and milk. He does not appear to be aware that the idea is not a new one, but it is nothing strange for a Frenchman to be ignorant of scientific researches in other countries. *Galignani's Messenger* gives the following summary of M. Marchand's communication to the *Journal des Connaissances Médicales* on the subject in question : —

"Milk taken alone is acknowledged to be one of the most valuable aliments known, suitable to all ages and constitutions, and eminently digestible except in certain morbid cases. Coffee, on the other hand, is in itself an excellent tonic and stimulant, which favors digestion after meals. But when the two beverages are mixed together, as is universally the case at breakfast on the Continent, and pretty frequently so in England, a chemical exchange takes place, producing a new agent that is utterly indigestible, and therefore absolutely incapable of assimilation when the mixture is effected in proper proportions. Thus, when a customer enters a coffee-house, calls for his *café au lait*, and tells the waiter how much milk he wants in it, he is simply deciding how much of his money he chooses to waste on a useless compound, and how little nourishment he is resolved to take. To understand this, let us consider that the skin of animals may be boiled down so as to become an eatable substance; but that the same skins taken to the tan-yard will be converted into an imputrescible article, which will defy all the power of the gastric juice to extract any nutritive matter therefrom. Now, all proteine substances, brought into contact with tannin, will behave in the same way as the skin; they will combine with the tannin, and resist digestion as well as putrefaction. The infusion of coffee intended for ingestion is extremely rich in tannin; consequently, when brought into contact with the albumen and caseine contained in milk, it will instantly transform these ingredients into an insoluble leather; the only difference being, that this coriaceous substance will be in the shape of an impalpable powder instead of forming a continuous sheet. This inert precipitate will remain in the stomach until carried off by other food, producing no other effect save that of impeding the full action of the gastric juice."

plate over a slow fire, and when reduced to one-half then filtered, after which three more ounces of alcohol are to be added. It is then ready for use. A tablespoonful of the mixture mixed with a teaspoonful of acetate of lead and twenty tablespoonfuls of water constitutes an excellent remedy. It is to be applied morning and evening on the burnt parts.

TOPICAL APPLICATION IN PAINFUL DENTITION.—The *Philadelphia Medical Times* gives this recipe :—

Syrup of tamarinds	2½ drachms.
Infusion of saffron	2 scruples.
Honey	2½ drachms.
Tinct. (essence) of vanilla	4 drops. Mix.

Rub gently over the gums with the finger or rag. An application of a similar character is the following :—

Saffron (powdered)	4 to 6 grs.
Honey	2 to 3 drachms.

Glycerine may be substituted for the honey.

TO RENDER COD-LIVER OIL TASTELESS.—Many formulæ for this purpose have been given, and the *Boston Medical and Surgical Journal* adds the following :—

Cod-liver oil	7 drachms.
Spt. lavand. comp.	1 drachm.
Brandy	1 " Mix.

AGREEABLE PURGATIVE.—The following is commended by good authorities :—

Calcined magnesia	1½ drachms.
Water	2 ounces.
Syr. orgeat (or Curaçoa)	½ ounce. Mix.

IODIZED COFFEE.—Dr. Calvo, the elder, recommends an iodized syrup of coffee containing the following :—

Syrup of coffee	500 grammes.
Potassium iodide	16 "

Dose.—Two or three spoonfuls each day.

Syrup of coffee is excellent for disguising the taste of iodide of potassium, and makes the use of this valuable remedy agreeable to the sick.

CINCHO-QUININE.—Messrs. Billings, Clapp, & Co. continue to receive hundreds of the most emphatic testimonials to the value of this agent from leading physicians in all parts of the country. A few of these may serve as samples of the whole.

Dr. John C. G. Robertson, of Paterson, N. J., writes, June 11th: "Cincho-Quinine I now use altogether in preference to any other preparation or combination."

Dr. J. Mackay, of Dallas, Texas, writes, June 22d: "Your Cincho-Quinine I have used with marked success. I prefer it in every way to the sulphate."

Dr. A. F. Reed, of Allenville, Missouri, under date of June 23, says: "I find it in every respect equal if not superior to the sulphate of quinia, especially with children. I had a case of bilious and remittent fever in a little boy two years of age. The fever was associated with gastric disturbance, and it was found impossible for the sulphate to be retained on the stomach; consequently I prescribed the cincho-quinine, which was retained, and the result was a rapid recovery."

Dr. I. Lewis Dorset, of Genito, Va., who has before borne witness on the subject, adds the following testimony under date of June 29th: "Since I have used about two

Coffee & Milk (1)

1876
THE PHYSICAL EFFECTS OF "COCA."—At a recent meeting of the Edinburgh Botanical Society, a paper was read by Sir Robert Christison on the restorative and curative effects of the coca leaf of Peru (*Erythroxylon coca*), which has for many years been valued by the Indians as a preventive of bodily fatigue, and which has lately attracted much attention, owing to a belief that it was of some service to the American pedestrian, Mr. Weston, on the occasion of some of his walking feats at the Agricultural Hall. A diversity of opinion exists as to the effects of the coca leaf on those who chew it. By some travelers it is maintained to be a pernicious stimulant, while others hold the opinion that, moderately used, it is beneficial to health. Of its effects Sir Robert Christison gave an account, ascertained by experiments he had made himself with a coca leaf, by which he had found that it was both a preventive of fatigue and a restorative of strength after severe bodily exertion, and that it had no reactionary effect on the system. His first experiments made with the leaf were in 1870. Two of his students had come home thoroughly tired out with a sixteen-miles walk; instead of having dinner they each took an infusion of two drachms of coca; presently all signs of fatigue vanished, and they "promenaded" Princes street for a whole hour with ease and enjoyment. On returning home they ate an excellent dinner, felt light throughout the evening, slept well, and got up refreshed and active next morning. Similar results were obtained in the case of other ten students, some of whom had done a thirty-miles walk, and Sir Robert has also made experiments upon himself with a coca leaf of an equally successful nature. He is, it seems, overwhelmed by letters from all quarters asking for information respecting it. Women especially, having tried every other form of narcotic and stimulant, are very anxious to begin with the coca leaf. One lady who has written to Sir Robert Christison on the subject, "put her question in such a shape that he saw plainly that she meant to ask whether it would renew her youth."

PEDESTRIANISM AND VERTIGO.—The success of Mr. Weston's recent walk at Birmingham (Eng.) was marred by the occurrence of vertigo. The *Lancet*, in referring to the latter condition, is "convinced that such exhibitions of endurance are made at great risk, and are difficult of justification. Walking is a natural thing, but walking 150 miles in 38 hours is not according to nature."

riolous patients into the wards of general hospit.
The Lyons people deserve to be "pitted."

FORK SWALLOWING.—On the 15th of April last M. Labbé performed gastrotomy at La Charité for the extraction of a fork which had been swallowed by a young man two years before, in a frolic. The presence of the fork was recognized in the stomach in an oblique position, with the prongs directed toward the

which had been 229 days in her stomach. M. Bailarger has reported in a recent number of the *Union Médicale* the case of a lunatic who lived six years with a tin fork in the stomach without feeling any inconvenience, except when making violent movements. After his death, which happened from other causes, the fork was found blackened and imbedded in food. Some thirty years ago, a mountebank, who was in the habit of putting different objects down his throat, let a fork slip into the stomach; the foreign body was immediately removed by the mouth by means of forceps. As may be seen from the cases thus briefly related, forks introduced into the stomach have been removed by very different procedures: 1. By gastrotomy; 2. By the mouth with forceps; 3. Through an abscess produced by adhesive inflammation of the walls of the stomach; 4. By the anus, without any medical or surgical interference."

CHILDREN'S HOSPITALS are to be established in Spain, supported, as here, by voluntary contributions.

LADY STUDENTS will not be admitted to the University of Prague.

IMMORALITY IN A PUBLIC INSTITUTION.—Dr. Fleming, the founder, and for many years the director, of the Institution for the Blind at Hanover, has been found guilty of immoral conduct towards his female pupils, and has been sentenced to nine years' imprisonment and a loss of civil rights for five years.

SMALL-POX IN BOMBAY.—There is an epidemic of small-pox in Bombay, and the town council has voted for compulsory vaccination.


CHOLERA.—The Prussian government has created a Cholera Committee, to deliberate on the measures to be taken in the event of an outbreak of the disease.


YELLOW FEVER IN RIO JANEIRO.—The deaths from yellow fever in this place average fifty daily.


The very latest statistics come from Copenhagen, and are dated August 8, 1872. They state that the whole crop of the world is ^{800 millions} 8,240,000 cwts.; of which Brazil, including Santos and Bahia, produces ^{400 millions lbs} 4,340,000 cwts., or more than half; that Ceylon and Central America come next, and are increasing their production. But the annual consumption has become 9,000,000 cwts., and so increased prices. Now the United States use 30 per cent. of all that is grown; and though


other resolutions, has affirmed that a
"wholesome and unquestionably just-
ifiable reform will be attained by the
abolition of surplice fees, stipends for
the mass, and the avoidance of the
nuisance and outgrowths of the sys-
tem of indulgences; the veneration of
the saints, the scapulary, medallions,
etc." This shows the way in which
the minds of the adherents of the
movement are tending. It is evident
that they are ashamed of, and anxious
to shake off, some of the grosser abuses
and superstitions of Popery, whilst
they cling to the framework of the
system. A strong desire for unity


CONSUMPTION OF TEA AND COFFEE.—The American Exchange and Review publishes an article on the consumption of tea and coffee in the United States and Great Britain, which shows a curious difference of taste or liking between the inhabitants of the two countries. During the first twenty years of our national existence the average annual consumption of tea was about half a pound to each inhabitant, and of coffee, about one and a half pounds. As one pound of tea is estimated to be equivalent in consumption to three of coffee, there was but little real difference in the amounts of the two articles. During the twenty-five years from 1850 to 1874 inclusive, the average annual consumption per individual was a fraction less than one pound of tea and more than five and three-quarter pounds of coffee. The average consumption of tea had been doubled during the interval of time, while the average consumption of coffee had been nearly quadrupled. Each person in the United States drinks what is equivalent to $8\frac{1}{4}$ pounds of coffee (reckoning one pound of tea equal to three pounds of coffee), while in the United Kingdom the total average consumption of tea and coffee is equivalent to about $13\frac{3}{4}$ pounds of coffee. In the United Kingdom the tea consumed is equivalent to thirteen times the coffee; while in the United States the coffee consumed is equivalent to twice the amount of tea. A part of this difference is brought about by the estimate that one pound of tea is equivalent to three of coffee, which may be a false estimate, but the actual quantities, pound for pound, show a remarkable difference of taste. Thus each individual in the United Kingdom uses one pound of coffee and $4\frac{1}{4}$ pounds of tea, while each individual in the United States uses one pound of tea and $5\frac{3}{4}$ pounds of coffee. The duties on the two articles in the two countries were such as to at least favor, if they did not develop, this difference of taste. In this country the duties on coffee, when it has been taxed at all, have been comparatively light, while down to 1831 the duties on tea averaged from 100 to 150 per cent. In Great Britain, on the other hand, coffee has been, until within twenty-five years, much more heavily taxed than tea. The writer in the Review says: "The effect, however, of this hypothesis, has long outlived the cause," but the doctrine of heredity may fully explain this remoteness of effect from a possible cause.


 NO. 908 RACE STREET.—A STORE AND Dwelling, 10 rooms, in perfect order; lot 16x56. Has been occupied by one tenant for over 30 years past as a dry goods store. For sale by D. WISTAR, 233 N. Tenth street. w-*


 FOR SALE—CORNER PROPERTY, ONE of the best locations in West Philadelphia; lot is 30 by 150, 11 rooms, all conveniences, stable and carriage house. A great bargain. CHARLES F. HALL, 3944 Lancaster avenue. wf*315


 FOR SALE OR RENT—A LARGE AND commodious house, in good repair; situated in the pleasant village of Swedesboro', adjoining the depot, containing three large rooms, kitchen, hall, on the first floor, six on second, four on third; cellar under the whole; pleasantly situated. Apply to ISAAC H. VANNEMAN, Swedesboro', New Jersey. 6t*246


 FOR SALE—MODERN FOUR-STORY Residence, 2104 Arch street, well built and in perfect order. J. M. GUNMEY & SONS, 733 Walnut street. 2t*426


 FOR SALE—NEAT DWELLINGS, CHEAP, on Lawrence st., north of Jefferson, \$3450, \$3350 and \$3150; and in the rear, on Godfrey ave., \$1700. Also on Fourth st., \$4900. P. WAGNER, 614 Spring Garden street. *440


 ONLY \$2600. EASY TERMS IF SOLD this week. Eight rooms, conveniences. Apply 503 Susquehanna avenue. 2t*348


 FOR SALE OR EXCHANGE, FOR CITY Property—An unsurpassable Farm of 29 acres, good buildings; plenty of fruit; near a station in Bucks co., about 30 miles out. For particulars, apply 1021 Morgan street, below Vine. *379


 FOR SALE, \$5500—AT MERCHANT-ville, N. J., a beautiful ten-roomed Villa, with conveniences, stable, chicken houses, shade, plenty of good water, &c. Terms easy. Apply Room No. 1, 122 South Second street. ws*544


 FOR SALE—A GOOD SEVEN-ROOMED House, on Dickinson street, No. 1131, the lot 16 by 110 feet. Also a Cottage House, No. 1214 Ellsworth street, lot 16 by 100 feet; price of both low, and easy terms. *594 P. WATSON, 332 Walnut st.

 \$1000 FOR A COMPLETE FOUR-ROOM House, on Cross street, above Tenth, subject to \$30 ground rent. P. WATSON, 332 Walnut, *593

 FOR SALE, VERY LOW, 8 AND 10-ROOM Houses, all modern improvements, Twenty-first and North College avenue. JOHN LYONS, 401 N. Tenth street. *897

 FOR SALE OR RENT, FURNISHED—TWO miles from Media, neat stone Residence, ten rooms, beautiful situation, 7 acres of rich land, fine fruit, shade and water. Price, \$5500. Rent, \$350 for the season. RANSOM ROGERS, *517 206 South Fifth street.

 FOR SALE—A STORE AND DWELLING Seventeenth and Titan streets; lot 17x73 feet liquor business. P. WATSON, 332 Walnut st. *592

 FOR SALE—STORE AND DWELLING N. E. corner of Eighth and June streets, below Fitzwater; good stand for any business; cheap for cash. *744

STEAMSHIP NOTICES, ETC.



AMERICAN LINE.

Weekly mail steamship service between PHILADELPHIA AND LIVERPOOL,

Calling at Queenstown, Sailing every Thursday from Philadelphia, and

of this "yaupon" (*The Journal of Applied Science*, September 1, 1874), and found that it contains a very large percentage of theine, besides a peculiar volatile oil having a tea-like odor. The specimen analyzed was composed in a very large proportion of twigs, yet the percentage of theine present was as great as that usually found in maté. The following table expresses the proportion in one hundred parts of the substances named:

	Yaupon.	Maté, or Paraguay tea.	Black tea, average.	Green tea, average.	Green tea.	Coffee.
		Stenhouse.	Mulder.	Mulder.	Pelilot.	Payen.
Volatile oil.	0.01		0.63	0.88	0.50	0.003
Caffeine.....	0.12	0.13	0.56	0.52	6.00	1.00
Tannin.....	2.41		2.04	17.68	14.00	10.00

SATURDAY, SEPTEMBER 26, 1874.

EDITORIAL.

THE AMERICAN TEA.

GROWING along the Atlantic coast of the United States, from Virginia southward, is the *Ilex cassine*, or, as it is sometimes called, the American tea,—a plant whose leaves, mixed with those of other species of the same genus, were used by the aborigines in forming the decoction known as "yaupon," or "black drink." The maté of Paraguay is closely allied in its botanical relations to the plant under consideration. It is well known that this Paraguay tea contains largely of theine, and the fact that the Northern Indians used our *Ilex* very much as the aborigines of Paraguay used their *Ilex*, ought, one would think, to have attracted attention long ago to the North American plant.

During the Revolution the leaves of the *Ceanothus Americanus* were used as a substitute for the Chinese herb, and, possibly owing to this fact, some few years since a company was organized for the purpose of producing, and actually did produce, a "tea" prepared from the *Ceanothus*. Analysis showed, however, that this product contained no theine; and, although the New Jersey staple was quite extensively advertised, it soon disappeared from sight. Subsequently, we were informed by a dealer that this American tea was still manufactured, but that it was used solely for the adulteration of the genuine article. Whether or not it is still produced we do not know.

A Mr. H. M. Smith has recently made an analysis

The yaupon leaves were a regular article of commerce among the North American Indians. The "black drink" was used by the Indians especially at their councils and tribal feasts. It was taken very strong, and in large quantities, and is said to have frequently acted as an emetic. It contained, however, besides the leaves of *Ilex cassine* those of the *Ilex vomitoria* and of other species of the genus, and it is possible that it owed to them its power of causing vomiting. Evidently, if the *Ilex cassine* possesses a persistent emetic property it will never afford a cup of tea which shall be popular with the white man. A general emesis might be a bond of misery among a council of Indians, but would hardly suit the average sippers of Bohea. Mr. Smith, however, failed to detect any emetic principle in the *Ilex cassine*, and the subject seems to demand further investigation.

provocation, some seven or eight years ago, would bear repetition and imitation by the Philadelphia County Medical Society, and all the other kindred bodies of this city.]”

The above extract is from a recent number of *The Cincinnati Medical News*. In reply, we can only state that if any regular physician in this city takes a commission from druggists he is very careful to keep his doings secret. Public medical opinion in this city certainly reprobates most earnestly such practice.

A WRITER in *The Journal of Applied Science* (September 1) states that castor-oil has so little effect on Chinese intestines that the Celestials use it habitually in cookery.

CORRESPONDENCE.

THE RECENT MEETING OF THE BRITISH MEDICAL ASSOCIATION.

NORWICH, ENGLAND, September 1, 1874.

DEAR SIR,—I had the honor of attending the dinner of the British Medical Association, in St. Andrew's Hall, on the evening of the third day of the meeting, which was a most genial and festal occasion. The grand old civic hall, that had been in ancient days a cathedral, and was adorned with portraits of local celebrities of the past, was transformed into a brilliant banqueting-saloon. There were music, and flowers, and fountains, and speech-making, both eloquent and hilarious; and, as the dining ended, a large assembly of ladies arrived and graced a platform arranged for them. The dinner-ceremonies opened with a blessing by a reverend canon, which was appropriately short, and it was followed by a most effective rendering of the majestic anthem of “God Save the Queen.” A military band played at intervals, and the peals of a trumpet pre-announced

Mr. Haughton, of Dublin, made a humorous characteristic speech, and the annual dinner concluded most happily when the ancient hall resounded to a roaring toast of “The Ladies.”

My estimate of the scientific character of the meeting is very high; and to this must be added the invaluable social influences of such a gathering of so many of the distinguished members of the profession in Great Britain, and of representatives of different nationalities abroad. As an American, I speak appreciatively of the distinguished attention and courtesy with which my countrymen were honored at this meeting. Such international representation is surely calculated to unite in the strongest sympathy the medical profession of different countries.

The occasional visits to America made by distinguished British physicians and surgeons, and the journeys undertaken every year by numbers of American medical men to Great Britain, have done much to add to the good feeling that has ever existed between the medical fraternities of the two countries. The bestowal of titled honors and distinguished social attentions on Professor Gross during his late visits to Europe have been received at home as compliments, through a representative man, to the whole profession in America. I think that I have never been introduced as an American surgeon to prominent surgeons anywhere in Europe without having kind and respectful inquiries made of me concerning Professors Gross, Pancoast, Sayre, Dr. Sims, Dr. Atlee, and a few other surgeons whose reputations have extended abroad.

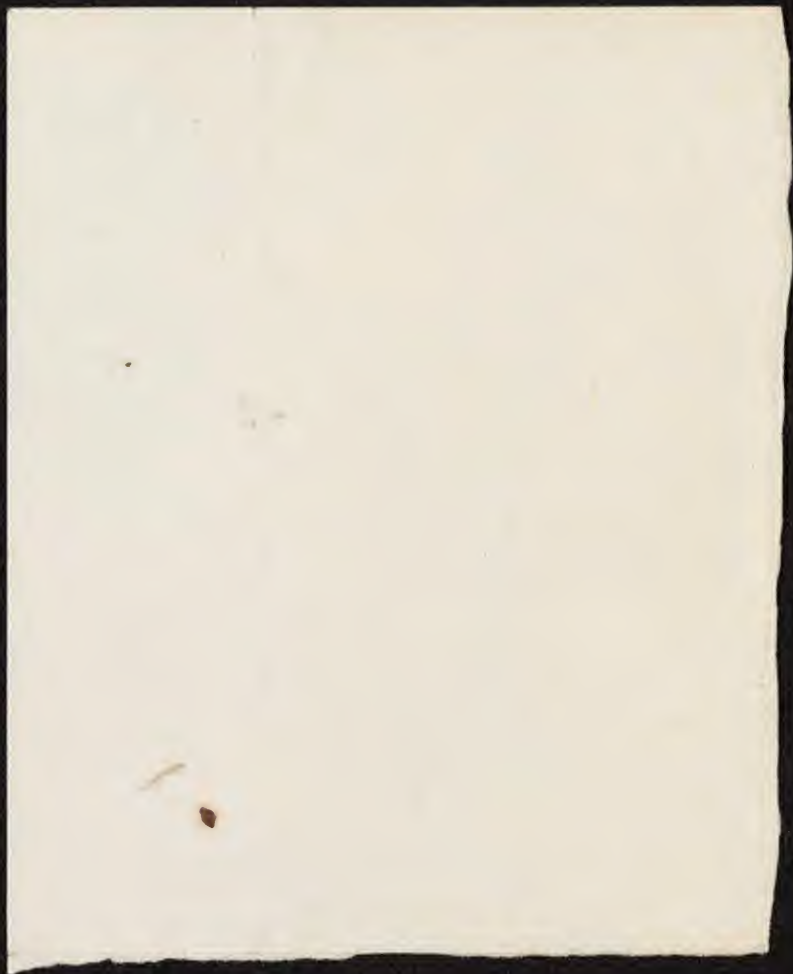
I can also speak from an extended intercourse, particularly with surgeons in Europe, of their warm feeling for the American people and of a general interest in the approaching Centennial Anniversary of our nationality. Sir James Paget expressed to me his especial desire to be at the celebration in Philadelphia on the Fourth of July, 1876, and said that he would take delight in the noisy enthusiasm of the day. I have received

De Gasparin recorded it as
a result of observation in the
regimen of Miners in
Belgium, ~~that~~ "the addition
of a quantity of coffee to the daily
rations enabled them to perform their
arduous labors on a diet which
was even below that found necessary
in prisons & elsewhere, where the article
was not employed."

(Sea water
2600 gr. solids.
to 1 gallon)

Druid Sea,
2000 gr. to 1 gallon

W. J. Youmans.



✕

Dr. Auguste Voisin (L. alco-
-olisme &c, p. 3) states that in
17 cases in which pregnancy resulted
from intercourse during the drunkenness
of the father, eleven of the children died
in convulsions. Of those who survived,
3 were idiots, 2 epileptics, & 1 subject
to chronic inflammation of the spinal
marrow.



" OF THE BRAIN.

- " Cerebral congestion.
- " Cerebral hemorrhage with its consequences, apoplexy and paralysis.
- " Meningeal hemorrhage.
- " Cerebral thrombosis.
- " Softening of the brain.
- " Aphasia.
- " Acute cerebral meningitis.
- " Chronic cerebral meningitis.
- " Abscess of the brain.
- " Multiple cerebral sclerosis, one of those diseases of which tremor is a characteristic symptom.
- " Every variety of insanity, including general paralysis.

" OF THE SPINAL CORD.

- " Spinal congestion.
- " Antero-lateral spinal sclerosis.
- " Postero-spinal sclerosis (Locomotor ataxia).

" CEREBRO-SPINAL DISEASES.

- " Epilepsy.
- " Chorea.
- " Multiple cerebro-spinal sclerosis, another of those affections characterized by tremor.
- " Athetosis, a remarkable disease which I was the first to describe, and which is now well recognized both in this country and in Europe. The case on which my description was based was one in which the patient was in the habit of drinking sixty glasses of gin daily.

" OF THE NERVES.

- " Anaesthesia.
- " Paralysis agitans.
- " Neuralgia in all situations.
- " Neuritis.
- " Neuro-sclerosis.
- " It will be noticed that sclerosis or hardening is a condition of all parts of the nervous system which alcohol probably often produces. It is doubtless the result of the direct action of alcohol on the nervous tissue.

"In addition to being the exciting cause of many diseases of the nervous system, alcohol probably predisposes to various others in which no direct relation can be traced. Neither does its action stop here, for the descendants of persons addicted to the excessive use of alcohol are liable to various disorders of the nervous system, and there is some evidence to show that offspring generated during a fit of intoxication of either parent are often born idiotic."



CAL RECORD.

expectation; *his* vitality and longevity, to wit, *his* viability.

But, it may be asked, how is this single fact to be arrived at, as men differ so much in kind and quality? Certainly not by any general average of thousands upon thousands of the same age; but by a close analyzation of all the facts and factors that pertain to this individual. There is the ancestral record; by it may be judged the average mortality age of his individual kind. He has inherited certain life processes which fix a term to his existence; he cannot live beyond them, he may shorten them. If he has done it, how and by what means? By dissipation, contracting incurable disease, overtaking his vital energies, dwelling in insalubrious districts, violating good sanitary laws, recklessness, useless exposure, or accident? Each and all of these elements of impairment must be weighed and judged as to their relative or combined influence in shortening the natural life term of the applicant under observation.

The preliminary step, then, should be to ascertain as far as it is possible from the ancestral family record of each person the ages of his living relatives, the ages of all who have died, and of what diseases they died. This record should include the grand-parents always, and as many of the great grand-parents as any record can show. It is important also that these statistics should be clearly obtained on both paternal and maternal branches—such as uncles and aunts, brothers and sisters—giving their ages and conditions of health if living; if dead, age at death and cause of decease. So much of the details of the physical characteristics of each of those persons as it may be possible to get should also be recorded.

We have now presented before us a series of lives through which and with which this one has many characteristics in common; he is after, and one of, that kind. Whatever of life is inheritable is here shown; whatever of inheritable disease he may or will have, if there has been any, will almost certainly appear somewhere in this record; and if there has been none, have we not the fact almost indubitably established that in him there will be none; therefore there is very, very little risk in that direction.

The next question in order is, naturally, the special constitutional characteristics of the individual, whereby we may judge from which branch of the parental house he inherits his strongest viability peculiarities, etc. These, in detail, include height, weight, equipoise, and both a general and minute descriptive picture of his outer person.

Habits, vocation, residence, intelligence, past and present health, and other incidental facts, such as exposure, various residences that he may have

1875
5481

EXCRETION OF ALCOHOL THROUGH THE RESPIRATORY TRACT (Schmidt: *Centralblatt für Chirurgie*, No. 23, 1875).—Heubach has recently confirmed the previous opinion that in febrile affections none, or but little, of the alcohol which is administered re-appears in the urine, and Schmidt has, in pursuance of similar investigations, sought to find the amount of spirit of wine contained in expired air.

The alcohol was always given four or five hours after the last meal, and during the time of the experiment the nose was closed by means of a clamp.

These experiments were carried out on ten patients, and to each of them at least fifty cubic centimetres were administered; but in no case could evidence be obtained of more than a trace of alcohol in the expired air.

W. A.

observed is to be explained by the unequal and irregular action of the aconite on one or other of the cardiac centres, and this may be due to an unequal distribution of the poison in the blood.

W. A.

SALICYLIC ACID IN CATARRH OF THE URINARY ORGANS.—Dr. Paul Fürbringer gives an account, in the *Berliner Klin. Wochens.*, 1875, No. 19, of four cases in which salicylic acid was used internally to combat alkaline fermentation of the urine.

The first case was that of a phthisical and paralyzed young man, whose urine was alkaline, fetid, threw down a voluminous precipitate of triple phosphate, urate of ammonium, and pus-corpuscles, and contained an innumerable number of bacteria. He was ordered fifteen grains of the acid in a mucilaginous potion daily, and after three days the urine showed an acid reaction with much less odor. The use of the acid

PRESENCE OF ALCOHOL IN THE HUMAN URINE.—

After having shown that urine on putrefying produces alcohol, M. Béchamp has sought to discover alcohol in the urine of persons who had previously been subjected to a *régime* of abstinence from wine and alcoholic drinks. In the urine collected in these conditions, and in which fermentation had been prevented by the addition of a little creosote, M. Béchamp has found enough alcohol to be able to set it on fire. In one of the experiments there was enough alcohol in two litres of urine to be determined by the alcoholometer. The author believes that the liver produces alcohol physiologically.—*Bordeaux Méd.*

1875

incomplete, and favors the exit of a portion of the transplanted tissue, preventing the formation of the cartilaginous masses. It also excites osteomyelitis in the same way as simple sections of bone in ordinary amputations when exposed to the air.—*Mouvement Médicale.*

ALBUMINURIA AS A SYMPTOM OF MENINGITIS. —Professor Rosenstein has noticed the coincidence of albuminuria with meningitis. The analysis of their urine demonstrates in nearly all patients, whether old or young, attacked with meningitis, the presence of albumen in the early days of the cerebral affection; and in a considerable number of these cases is found at the same time, among the products of the renal secretion.

On the Influence of Alcohol on the Temperature of the Human Body.

We are indebted to the *Berliner Klinische Wochenschrift* for the following abstract of the original paper by RIEGEL in the *Deutsches Archiv für Klinische Medicin*, vol. xii. parts 1 and 2.

The ordinary sources of fallacy in experiments on the action of alcohol were, as far as possible, guarded against by Riegel, as follows. 1. Not content with prefixing one typical or theoretical curve of normal temperatures to the whole set of experiments, he constructed and prefixed to each experiment a normal temperature curve of the subject of such experiment, drawn from actual observation of each individual. 2. The measurements of temperature were simultaneously made in the axilla and in the rectum; it could not, therefore, be objected that the slight depressions were due to the thermometer shifting in the axilla, etc.

On the whole, his experiments confirm those of Binz and Bouvier (we may also add, of Dr. Parkes, Dogiel, Sydney Ringer, and Dr. W. Bathurst Woodman). The general results of the experiments are the following:—

1. Alcohol depresses the temperature, not only in febrile diseases, such as typhus, erysipelas, and pneumonia, but in a febrile condition also; this depression generally amounts to only a few tenths of a degree (Centigrade), and lasts for a short time only. Very rarely there is an equally great rise of temperature.

2. In those recovering from severe illness, the downfall is somewhat less, or, more often, altogether absent. This is also the case in those habituated to alcohol.

3. The larger the dose, the greater the downfall of temperature.

4. Riegel concludes that, although alcohol scarcely deserves the reputation given to it in England, as a decided depressor of temperature, yet, on the other hand, it never essentially raises the temperature—the constant dread of continental practitioners—and it is decidedly one of those things which diminish bodily waste, like tea and coffee.—*London Med. Record*, May 13, 1874.

soon after the transfusion, there was pain in the region of the lower spinal nerves, with urticaria; and in one case, after a considerable quantity had been transfused, albumen and blood appeared in urine.—*London Med. Record*, Dec. 31, 1873.

On Solutions of Morphia for Hypodermic Injection.

Mr. C. T. VACHELL suggests (*Lancet*, Nov. 29, p. 797) the desirability of fixing a standard strength for the solutions of morphia used for subcutaneous injection. To obtain a clear solution, without excess of acid, is not very speedily effected; and he thinks it would be a convenience to the practitioner to be able to purchase a carefully prepared solution of standard strength. Mr. Vachell proposes the following formula:—

Acetate of morphia	. . . . .	1 drachm.
Distilled water	. . . . .	12 drachms.
Acetic acid	. . . . .	As much as is sufficient.

He states that one-twelfth of a grain of acetate of morphia would be contained in a minim of such a solution; the dose would, therefore, be from two to four minims. Some such formula, he thinks, might be inserted in the next edition of the *British Pharmacopœia*.

Dr. WHITE has since pointed out (*Lancet*, Dec. 20) that no allowance is made in the foregoing for the increase of bulk by the addition of the solid, and that a minim would contain not one-twelfth, but one-thirteenth. He says that he makes his solution as follows:—

Acetate of morphia	. . . . .	1 scruple.
Distilled water	. . . . .	140 minims.
Acetic acid, B. P.	. . . . .	5 minims.

Dissolve with gentle heat in a test tube. The solution measures exactly 160 minims, consequently 8 minims would contain one grain of acetate of morphia. As a standard solution he suggests one-half the strength of the above. The hydrochlorate is used by Mr. White (*Lancet*, Jan. 3) in the proportion of 8 grains to 160 minims.

87.
10/10/1874
Dunbar

Sanary, T. méri, ~~Richards~~ ~~Richards~~

~~Richards~~ C. Bouvier, — F. Riegel,
Davis (1851) Anstie, B. M. Richardson, S. Ringer & others

have proved that alcohol in considerable
doses during health lowers temp. A pint
or two of beer (3 to 4 per cent alcohol) ^{will} reduce it
about 9/10th of a degree Fahr. in 1/4 hour, effect
lasting 1 1/2 hours. Same Brandy likewise.

Hot drinks have this effect modified.

[Coffee & strong tea, raise temp. $\frac{1}{3}$ to $\frac{3}{4}$ F.
In 1874 coffee raised my hand temp. to near 99.5°. Alex. Bennett
Maxim. recorded in an hour, Coffee most.
says first diminishes temperature
(S. Ringer, Anstie & Co)]

After Brandy, depression of temp. followed
by strong reaction. (The latter not observed by several
experimenters)

"In febrile conditions ^{the} effect of alcohol is
to lower temperature, as several English observers
have announced from clinical observations, and
C. Bouvier has ^{also} proved by experiments." This is not
incompat. with fact of very high temp. ^{next} to termina. of
fatal Delirium tremens. Opium, hydropyramic acid,
hyoscyamus, digitalis, belladonna, tobacco, camphor, oxalic
acid, etc. all lower temperature. (Brown Sequard & others)

2

~~See Richardson, Living Age, 1872.~~

Now, how is it that alcohol, a combustible material, composed of C & H, not saturated with oxygen, can when administered, lower the temperature, as in typhus or typhoid fever?

Either by one or both of two ways:

1. the heat produced by its oxidation & combustion may be less than from oxidation of the tissues, or other ingredients of the blood;
2. by giving tone to the cerebral ganglionic centres, the whole rate of oxidation in the system may be lowered.

Quite potent both are true.

was, indeed, the first losing hazard he had ever made; never having played before on a table with pockets. His next stroke was not so successful; and so he consoled himself with lighting a Partaga about eight inches in length.

"At all events," he continued, "your language has not the difference of '*Sie*' and '*du*,' which is a great advantage. Oh, it is a very perplexing thing sometimes. Suppose you do know a young lady very well, and you have agreed with her in private you shall always call each other '*du*;' and then before other people you call her '*Sie*'—it is very hard not to call her '*du*,' by mistake, and then everyone jumps up, and stares at you, and all the secret is known. That is a very terrible thing."

"And please what is the interesting ceremony with which you drink *brüderschaft* with a young lady? The same as usual?—a large jug of beer—your arms intertwined—"

"No—no—no!" he cried. "It is all a mystery. You shall not know anything of that. But it is very good—it is a very pleasant thing—to have *brüderschaft* with a young lady—although you drink no beer, and have no ceremonies about it."

"And what did *Fräulein Fallersleben's* mamma say when you called her daughter '*du*' by mistake?"

The large empty room resounded with the Lieutenant's laughter.

"That is a good guess—oh! a very good guess—but not just good enough. For it was she who did call me '*du*;' and all the people were surprised—and then some did laugh—but she herself—oh! she was very angry with herself, and with me too, and for some time she called me '*Sie*' even when we were together, until it was like to be a quarrel. But one more quarrel," added the Lieutenant, with indifference, "was not much matter. It was usually one every day—and then writing of sorrowful letters at the night—and next morning some reconciliation—*Sackermant!* what is the use of talking of all that nonsense!"

And then once more the ball flew about the table; finally lodging in a pocket, and scoring three for a miss. Indeed, our Uhlán was not at home with our big English tables, their small balls, pointed cues, and perpetual pockets. Even when he got a good chance of a cannon, the smallness of the balls caused him to fail entirely. But he had a very excellent cigar. It was something to be away from the embarrassment that had prevailed at dinner.

Perhaps, too, he enjoyed a certain sense of austere self-satisfaction in having left to Arthur full possession of the field. On the whole he enjoyed himself very well; and then, our cigars being finished, we had a final look at the horses, and then returned to the coffee-room.

"I am afraid," said Von Rosen, with some alarm, "we have been negligent of our duties."

Master Arthur had left some half-hour before. The ladies had retired. Only one or two of the heaviest toppers were left in the bar-parlour; the waiters looked as if they considered their week's work fairly over.

"Tell me," said my Prussian friend, as he got his candle, "is that young gentleman coming round here to-morrow?"

"Probably he is."

"Do you not think, then, it would be good to hire a vehicle and go away somewhere for a drive all the day before he comes?"

"To-morrow is Sunday."

"Well?"

"Do you fancy you would get either Bell or my Lady to go driving on Sunday? Don't you propose such a thing, if you are wise. There is a Cathedral in this town; and the best thing you can do is to study its history and associations early in the morning. You will have plenty of time to think over them to-morrow, inside the building itself."

"Oh, I do not object to that," he remarked, coolly, as he went upstairs, "and I do not care to have too much driving—it is only to prevent *Made-moiselle* being annoyed, as I think she was at dinner this evening—that is all. I suppose we may go for a walk to-morrow after the church-time? And he will come? Very well, he will not harm me, I am sure; but—but it is a pity—that is all."

And with this somewhat mysterious conclusion, the Lieutenant disappeared towards his own room.

From The Popular Science Review.
THE PHYSIOLOGICAL POSITION OF
ALCOHOL.

BY DR. RICHARDSON, F.R.S.

At the present moment, the "Alcohol Question," as it is called, is, in various ways, one of the most anxious subjects of out-door controversy. The leaders of the temperance movement, seeing the tide that

was once against them hesitating, if not turning in their favour, are redoubling their efforts with a certain improvement of method which bodes better for them and their works: the politicians are beginning to consider the solution of the problem of the successful management, by act of Parliament, of the "habitual drunkard:" the statist is re-collecting and revising his tables on the influence of alcohol upon the health, the wealth, and the vitality of communities: the actuary is learning that, with an advance of temperance, his calculations may require amendment: the people resident in quiet and respectable villages, or in sections of great cities and towns, are silently but surely conspiring against that old institution, the public hostel, and that older of institutions still, "mine host" of the hostel: the chemists are busy with their analyses of wines, beers, and spirits, and are charged with subtle arguments on the question whether the animal body, by its living force, can turn alcohol into new and different products of the organic series: and lastly, but by no means leastly, the doctors are making clean breasts on the subject of their dealings with alcohol in the sick room, in a strain which partakes rather of sentiment than of reality, or of that serene judgment and reflection so becoming to the professional mind. In the midst of this singular revolution of thought and of revelation of fact against the use of alcohol, it is, I had almost said, appalling to observe how its use extends. What is protest in theory is met by counter-protest in practice. Is theory or practice false? That is the question.

The answer I shall try herewith to give to that question shall consist of fact and suggestion. I have no part in mere controversy. I have tried by experiment and experience to read the physiological action of alcohol, and the reading thus obtained I propose to put forward in this brief chronicle. Let the reader, if he choose, take up the controversy from the narrative.

I would deal now with one part of the science side of the alcohol question, and which, put in very simple language, would stand as follows: Is alcohol good for the health of man and the lower animals? Does it give them strength, readiness for work, endurance for work, length of days, happiness? To answer the question relating to the lower animals first, we may, I think, come to the safe conclusion that alcohol is not good for animals under the rank of man. Calves fed on gin-balls—barley meal and gin—are very soon pre-

pared for the *abattoir*, but are not exalted into anything very sprightly and lovely in the bovine line. On the contrary, they are rendered dull, slothful, sleepy calves, on whose bodies the advice "Rest and be thankful" is morally branded. Cats and kittens are equally deteriorated by alcohol. I knew some young people who gradually taught a favourite kitten to walk round the dinner-table during dessert and taste wine. It was not long before the taste became a luxurious habit with the animal, but she soon began to fail under it. She slept half her life, lost all desire for play, and in the course of a month or two was dropsical and beyond cure. She contracted the liver disease called cirrhosis, and a very perfect specimen of the disorder she presented after her untimely death. I have observed that birds can be made to acquire a taste for alcohol. Pigeons and fowls, after a little training, will pick up peas saturated with spirit, and subsist on such diet. The animals fatten and sleep, but they lose their vivacity, and certainly lose their muscular power. The same rule holds good with fish. These animals, under the feeble but steady influence of alcohol, become indolent and sleepy and soon die.

On the whole, then, we may conclude safely that god Bacchus meant wine and all its allies specially for man. Perhaps he foresaw that it would be too expensive an article for beasts generally, and so wisely limited its adaptation; or perhaps he did not adapt it wisely for the good of man, since, according to the best accounts of him from those his votaries who believe in him, he was not a personage who went deeply into any other subject than wine. Was he wise, and is alcohol bad for beasts, good for man? We will turn to this question.

It is right, before entering on this question, to say that under the word alcohol I mean specifically the alcohol which ordinarily enters into wines, beers, spirits, and upon which their action as stimulants depends. There are many other substances included now, by chemists, under the term alcohols, such as methylic, butylic, and amylic alcohols; and there is another singular alcohol called mercaptan, or sulphur alcohol, in which the element sulphur replaces the element oxygen of common alcohol. Certain of these other alcohols—those above named particularly—I have made, also, subject of physiological study; and the report of their action would afford scope for an article that could not, I think, fail to be of interest to scientific readers.

whose tastes lean towards physiological research. But, as it will be simplest to begin with the alcohol that is best known, and for good or for evil is most potent in the world in our time, I confine, on this occasion, myself to it — *ethylic or common alcohol*.

Ethylic alcohol will enter the animal body by any channel through which it can be administered. It may be introduced by the stomach, by the connective tissue beneath the skin, into which it can be readily injected, and by the inhalation of its vapour by the lungs. This last method of administration is, however, the most difficult, the quantity required for the production of an effect being considerable, and the time required very long. The animals most susceptible to the action of alcohol-vapour are pigeons; but even they resist the influence of the vapour so determinately, that the same quantity which would produce a profound effect in half-an-hour, were it injected subcutaneously, exerts no marked influence if administered through the air.

But in whatever mode alcohol may be passed into the living body to produce modification of physiological action, the changes it excites are remarkably uniform, and *cæteris paribus* the amount required to induce the changes is also uniform. Thus, I have found, by many researches, that the proportion of sixty grains of alcohol to the pound weight of the animal body is the quantity capable of producing an extreme effect.

The order of the changes induced is, in like manner, singularly uniform, and extends in a methodical way through all classes of animals that may be subjected to the influence; and as the details of this part of my subject are the facts that concern us most, I shall expend some time in their narration.

The first symptom of moment that attracts attention, after alcohol has commenced to take effect on the animal body, is what may be called vascular excitement; in other words, over-action of the arterial vessels and of the heart, or, speaking still more correctly, over-action of the heart and arterial vessels. The heart beats more quickly, and thereupon the pulse rises. There may be some other symptoms of a subjective kind — symptoms felt by the person or animal under the alcohol — but this one symptom of vascular excitement is the first objective symptom, or that which is presented to the observer. I endeavoured in one research to determine from observations on inferior animals what was

the actual degree of vascular excitement induced by alcohol, and my results were full of interest. They have, however, been entirely superseded by the observations made on the human subject by Dr. Parkes and Count Wollowicz.

These observers conducted their enquiries on the young and healthy adult man. They counted the beats of the heart, first at regular intervals, during what were called water periods, that is to say, during periods when the subject under observation drank nothing but water; and next, taking still the same subject, they counted the beats of the heart during successive periods in which alcohol was taken in increasing quantities: thus step by step they measured the precise action of alcohol on the heart, and thereby the precise primary influence induced by alcohol. Their results were as follows: —

The average number of beats of the heart in 24 hours (as calculated from eight observations made in 14 hours) during the first, or water period, was 106,000; in the alcoholic period it was 127,000, or about 21,000 more; and in the brandy period it was 131,000, or 25,000 more.

The highest of the daily mean of the pulse observed during the first or water period was 77.5; but on this day two observations are deficient. The next highest daily mean was 77 beats.

If, instead of the mean of the eight days, or 73.57, we compare the mean of this one day, viz., 77 beats per minute, with the alcoholic days, so as to be sure not to over-estimate the action of the alcohol, we find: —

On the 9th day with one fluid ounce of alcohol the heart beat 430 times more.

On the 10th day, with two fluid ounces, 1,872 times more.

On the 11th day, with four fluid ounces, 12,960 times more.

On the 12th day, with six fluid ounces, 30,672 times more.

On the 13th day, with eight fluid ounces, 23,904 times more.

On the 14th day, with eight fluid ounces, 25,488 times more.

But as there was ephemeral fever on the 12th day it is right to make a deduction, and to estimate the number of beats in that day as midway between the 11th and 13th days, or 18,432. Adopting this, the mean daily excess of beats during the alcoholic days was 14,492, or an increase of rather more than 13 per cent.

The first day of alcohol gave an excess of 4 per cent., and the last of 23 per cent.; and the mean of these two gives almost

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the same percentage of excess as the mean of the six days.

Admitting that each beat of the heart was as strong during the alcoholic period as in the water period (and it was really more powerful), the heart on the last two days of alcohol was doing one-fifth more work.

Adopting the lowest estimate which has been given of the daily work done by the heart, viz., as equal to 122 tons lifted one foot, the heart, during the alcoholic period, did daily work in excess equal to lifting 158 tons one foot, and in the last two days did extra work to the amount of 24 tons lifted as far.

The period of rest for the heart was shortened, though, perhaps, not to such an extent as would be inferred from the number of beats; for each contraction was sooner over. The heart on the fifth and sixth days after alcohol was left off, and apparently at the time when the last traces of alcohol were eliminated, showed in the sphygmographic tracings signs of unusual feebleness; and, perhaps, in consequence of this, when the brandy quickened the heart again, the tracings showed a more rapid contraction of the ventricles, but less power, than in the alcoholic period. The brandy acted, in fact, on a heart whose nutrition had not been perfectly restored.

It is difficult, at first glance, to realize the excessive amount of work performed by the heart under this extreme excitement. Little wonder it is that, after the labour imposed upon it by six ounces of alcohol, the heart should flag; still less wonder that the brain and muscles which depend upon the heart for their blood supply should be languid for many hours, and should require the rest of long sleep for renovation. It is hard physical work, in short, to fight against alcohol; harder than rowing, walking, wrestling, carrying heavy weights, coal-heaving, or the tread-wheel itself.

While the heart is thus labouring under the action of alcoholic stimulation, a change is observable in the extreme circulation — that circulation of blood which by varying shades of colour in exposed parts of the body, such as the cheek, is visible to the eye. The peripheral circulation is quickened, the vessel distended. We see this usually in persons under the influence of wine in the early stage, and we speak of it as the flush produced by wine. The authors I have already quoted report upon it in definite terms. "The peripheral circulation (during alcoholic excitement) was accele-

rated, and the vessels were enlarged, and the effect was so marked as to show that this is an important influence for good or for evil when alcohol is used."

By common observation the flush seen on the cheek during the first stage of alcoholic excitation is supposed to extend merely to the parts actually seen. It cannot, however, be too forcibly impressed on the mind of the reader that the condition is universal in the body. If the lungs could be seen they, too, would be found with their vessels injected; if the brain and spinal cord could be laid open to view they would be discovered in the same condition; if the stomach, the liver, the spleen, the kidneys, or any other vascular organs or parts could be laid open to the eye, the vascular enlargement would be equally manifest.

In course of time, in persons accustomed to alcohol, the vascular changes, temporary only in the noviciate, become confirmed and permanent. The bloom on the nose which characterizes the genial toper is the established sign of alcoholic action on vascular structure.

Recently some new physiological enquiries have served to explain the reason why, under alcohol, the heart at first beats so quickly and why the pulses rise. At one time it was imagined that the alcohol acted immediately upon the heart, stimulating it to increased action, and from this idea — false idea, I should say — of the primary action of alcohol, many erroneous conclusions have been drawn. We have now learned that there exist many chemical bodies which act directly by producing a paralysis of the organic nervous supply of the vessels which constitute the minute vascular circuit. These minute vessels when paralyzed offer inefficient resistance to the stroke of the heart, and the heart thus liberated, like the mainspring of a clock from which the resistance has been removed, quickens in action, dilating the minute and feebly-acting vessels, and giving evidence really not of increased but of wasted power.

The phenomena noticed above constitute the first stage of alcoholic action on the body; we may call it the stage of excitement; it corresponds with a similar stage or degree caused by chloroform.

If the action of alcohol be carried further, a new set of changes are induced in another part of the nervous system — the spinal system. Whether this change be due simply to the modification of the circulation in the spinal cord, or to the direct action of the alcohol upon the nervous

(Influence on nerve-cell substance)

change of function is well marked, and it consists of deficient power of co-ordination of muscular movement. The nervous control of certain of the muscles is lost, and the nervous stimulus is more or less enfeebled. The muscles of the lower lip in the human subject usually fail first of all, then the muscles of the lower limbs, and it is worthy of remark that the flexor muscles give way earlier than the extensors. The muscles themselves by this time are also failing in power; they respond more feebly than is natural to the galvanic stimulus; they, too, are coming under the depressing influence of the paralyzing agent, their structure temporarily changed, and their contractile power everywhere reduced. This modification of the animal functions under alcohol marks the second degree of its action. In this degree, in young subjects, there is usually vomiting, and in birds this symptom is invariable. Under chloroform there is produced a degree or stage of action holding the same place in the order of phenomena.

The influence of the alcohol continued still longer, the upper portions of the cerebral mass, or larger brain, become implicated. These are the centres of thought and volition, and as they become unbalanced and thrown into chaos, the mind loses equilibrium, and the rational part of the nature of the man gives way before the emotional, passionate, or mere organic part. The reason now is off duty, or is fooling with duty, and all the mere animal instincts and sentiments are laid atrociously bare. The coward shows up more craven, the braggart more braggart, the bold more bold, the cruel more cruel, the ignorant more ignorant, the untruthful more untruthful, the carnal more carnal. "In vino veritas" expresses faithfully, indeed even to physiological accuracy, a true condition. The spirits of the emotions are all in revel, and are prepared to rattle over each other in wild disorder; foolish sentimentality, extending to tears, grotesque and meaningless laughter, absurd promises and asseverations, inane threats or childish predictions impel the tongue, until at last there is failure of the senses, distortion of the objective realities of life, obscurity, sleep, insensibility, and utter muscular prostration. This constitutes the third stage of alcoholic intoxication. It is the stage of insensibility under chloroform when the surgeon performs his painless task.

While these changes in the action of the nervous system are in progress there is a

proceeding in respect to the temperature of the body. For a little time the external or surface temperature is increased, especially in those parts that are unduly charged and flushed with blood. But it is to be observed that in respect to the mass of the body the tendency is to a fall of temperature. In the progress towards complete intoxication under alcohol, however, there are, as we have already seen, three degrees or stages. The first is a stage of simple exhilaration, the second of excitement, the third of rambling insensibility, and the fourth of entire unconsciousness, with muscular prostration. The duration of these stages can be modified in the most remarkable manner by the mode of administration; but whether they are developed or recovered from in an hour or a day, they are always present except in cases where the quantity of alcohol administered is in such excess that life instantly is endangered or destroyed. In the first or exhilarative stage the temperature undergoes a slight increase; in birds a degree Fahrenheit, in mammals half a degree. In the second degree, during which there is vomiting in birds, or attempts at vomiting, the temperature comes back to its natural standard, but soon begins to fall; and during the third degree the decline continues. The third degree fully established, the temperature falls to its first minimum, and in birds comes down from five and a half to six degrees; in rabbits from two and a half to three degrees. In this condition the animal temperature often remains until there are signs of recovery, viz., conscious or semi-conscious movements, upon which there may be a second fall of temperature of two or even three degrees in birds. In this course of recovery I have seen, for instance, the temperature of a pigeon which had a natural standard of 110° Fahr. reduced to 102° . Usually with this depression of force there is a desire for sleep, and with perfect rest in a warm air there is a return of animal heat; but the return is very slow, the space of time required to bring back the natural heat being from three to four times longer than that which was required to reduce it to the minimum.

In these fluctuations of temperature the ordinary influences of the external air play an important part as regards duration of the fluctuation, and to some extent as regards extremes of fluctuation.

These facts respecting fall of temperature of the animal body under alcohol were derived from observations originally taken from the inferior animals; they have been

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confirmed since by other observers from the human subject. Dr. De Marmon, of King's Bridge, New York, has specially proved this fact in some instances of poisoning by whiskey in young children. In one of these examples the temperature of the body fell from the natural standard of 98° Fahr. to 94°, in another to 93 1-2°.

Through all the three stages noticed in the above, the decline of animal heat is a steadily progressing phenomenon. It is true that in the first stage the heat of the flushed parts of the body is for a brief time raised, but this is due to greater distribution of blood and increased radiation, not to an actual increment of heat within the body. The mass of the body is cooling, in fact, while the surfaces are more briskly radiating, and soon, as the supply of heat-motion fails, there is fall of surface temperature also; a fall becoming more decided from hour to hour up to the occurrence of the fourth and final stage, of which I have now to treat.

The fourth degree of alcoholic intoxication is one of collapse of the volitional nervous centres, of the muscular organs under the the control of those centres, and of some of the organic or mere animal centres. It is true that while the body lies prostrate under alcohol there are observed certain curious movements of the limbs, but these are not stimulated from the centres of volition, nor are they reflected motions derived from any external stimulus; they are strange automatic movements, as if still in the spinal cord there were some life, and they continue irregularly nearly to the end of the chapter, even when the end is death.

Through the whole of this last stage two centres remain longest true to their duty, the centre that calls into play the respiratory action, and the centre that stimulates the heart. There is then an interval during which there are no movements whatever, save these of the diaphragm and the heart, and when these fail the primary failure is in the breathing muscle: to the last the heart continues in action.

The leading peculiarity of the action of alcohol is the slowness with which the two centres that supply the heart and the great respiratory muscle are affected. In this lies the comparative safety of alcohol: acting evenly and slowly, the different systems of organs die after each other, or together, gently, with the exception of those two on which the continuance of mere animal life depends. But for this provision every deeply intoxicated animal would inevitably die.

under favourable circumstances the intoxicated live: the temperature of the body sinks two or three degrees lower, but the alcohol diffusing through all the tissues, and escaping by diffusion and elimination, the living centres are slowly relieved, and so there is slow return of power. If death actually occurs, the cause of it is condensation of fluid on the bronchial surfaces and arrest of respiration from this purely mechanical cause. The animal is literally drowned in his own secretion.

Such are the stages or degrees of alcoholic narcotism, from the first to the last. And with the description of them, and the order in which they come, my present task is well nigh complete. There arise, however, a few thoughts and suggestions deserving of brief notice.

1. In the first place we gather from the physiological reading of the action of alcohol that the agent is a narcotic. I have compared it throughout to chloroform, and the comparison is good in all respects save one, viz. that alcohol is less fatal than chloroform as an immediate destroyer. It kills certainly in its own way to the extent, according to Dr. De Marmon, of fifty thousand persons a year in England, and ten thousand a year in Russia, but its method of killing is slow, indirect, and by painful disease.

2. The well proven fact that alcohol, when it is taken into the body, reduces the animal temperature, is full of the most important suggestions. The fact shows that alcohol does not in any sense act as a supplier of vital heat as is so commonly supposed, and that it does not prevent the loss of heat as those imagine "who take just a drop to keep out the cold." It shows, on the contrary, that cold and alcohol in their effects on the body run closely together, an opinion most fully confirmed by the experience of those who live or travel in cold regions of the earth. The experiences of the Arctic voyagers, of the leaders of the great Napoleonic campaign in Russia, of the good monks of St. Bernard, all testify that death from cold is accelerated by its ally alcohol. Experiments with alcohol in extreme cold tell the like story, while the chilliness of body which succeeds upon even a moderate excess of alcoholic indulgence leads direct to the same indication of truth.

3. The conclusive evidence now in our possession that alcohol taken into the animal body sets free the heart, so as to cause the excess of motion of which the record has been given above, is proof that

Experiment on Animals ditto

the heart, under the frequent influence of alcohol, must undergo deleterious change of structure. It may, indeed, be admitted in proper fairness, that when the heart is passing through this rapid movement it is working under less pressure than when its movements are slow and natural; and this allowance must needs be made or the inference would be that the organ ought to stop at once in function by the excess of strain put upon it. At the same time the excess of motion is unquestionably injurious to the heart and to the body at large: it subjects the body in all its parts to irregularity of supply of blood; it subjects the heart to the same injurious influence; it weakens and, as a necessary sequence, degrades both the body and the heart.

4. Speaking honestly, I cannot, by any argument yet presented to me, admit the alcohols by any sign that should distinguish them from other chemical substances of the exciting and depressing narcotic class. When it is physiologically understood that what is called stimulation or excitement is, in absolute fact, a relaxation, I had nearly said a paralysis, of one of the most important mechanisms in the animal body — the minute, resisting, compensating circulation — we grasp quickly the error in respect to the action of stimulants in which we have been educated, and obtain a clear solution of the well known experience that all excitement, all passion, leaves, after its departure, lowness of heart, depression of mind, sadness of spirit. We learn, then, in respect to alcohol, that the temporary excitement it produces is at the expense of the animal force, and that the ideas of its being necessary to resort to it, that it may lift up the forces of the animal body into true and firm and even activity, or that it may add something useful to the living tissues, are errors as solemn as they are widely disseminated. In the scientific education of the people no fact is more deserving of special comment than this fact, that excitement is wasted force, the running down of the animal mechanism before it has served out its time of motion.

5. It will be said that alcohol cheers the weary, and that to take a little wine for the stomach's sake is one of those lessons that comes from the deep recesses of human nature. I am not so obstinate as to deny this argument. There are times in the life of man when the heart is oppressed, when the resistance to its motion is excessive, and when blood flows languidly to the centres of life, nervous and

muscular. In these moments alcohol cheers. It lets loose the heart from its oppression, it lets flow a brisker current of blood into the failing organs; it aids nutritive changes, and altogether is of temporary service to man. So far alcohol is good, and if its use could be limited to this one action, this one purpose, it would be amongst the most excellent of the gifts of nature to mankind. Unhappily, the border line between this use and the abuse of it, the temptation to extend beyond the use, the habit to apply the use when it is not wanted as readily as when it is wanted, overbalance, in the multitude of men, the temporary value that attaches truly to alcohol as a physiological agent. Hence alcohol becomes a dangerous instrument even in the hands of the strong and wise, a murderous instrument in the hands of the foolish and weak. Used too frequently, used too excessively, the agent that in moderation cheers the failing body, relaxes its parts too extremely; spoils vital organs; makes the course of the circulation slow, imperfect, irregular; suggests the call for more stimulation; tempts to renewal of the evil, and ruins the mechanism of the healthy animal before its hour for ruin, by natural decay, should be at all near.

6. It is assumed by most persons that alcohol gives strength, and we hear feeble persons saying daily that they are being kept up by stimulants. This means actually that they are being kept down, but the sensation they derive from the immediate action of the stimulant deceives them and leads them to attribute lasting good to what, in the large majority of cases, is persistent evil. The evidence is all-perfect that alcohol gives no potential power to brain or muscle. During the first stage of its action it may enable a wearied or feeble organism to do brisk work for a short time; it may make the mind briefly brilliant; it may excite muscle to quick action, but it does nothing at its own cost, fills up nothing it has destroyed as it leads to destruction. A fire makes a brilliant sight, but it leaves a desolation; and thus with alcohol.

On the muscular force the very slightest excess of alcoholic influence is injurious. I find by measuring the power of muscle for contraction in the natural state and under alcohol, that so soon as there is a distinct indication of muscular disturbance, there is also indication of muscular failure, and if I wished, by scientific experiment, to spoil for work the most perfect specimen of a working animal, say a

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horse, without inflicting mechanical injury, I could choose no better agent for the purpose of the experiment than alcohol. But alas! the readiness with which strong well-built men slip into general paralysis under the continued influence of this false support, attests how unnecessary it were to put a lower animal to the proof of an experiment. The experiment is a custom, and man is the subject.

7. It may be urged that men take alcohol, nevertheless, take it freely and yet live; that the adult Swede drinks his average cup of twenty-five gallons of alcohol per year and yet remains on the face of the earth. I admit force even in this argument, for I know that under the persistent use of alcohol there is a secondary provision for the continuance of life. In the confirmed alcoholic the alcohol is in a certain sense so disposed of that it fits, as it were, the body for a long season, nay, becomes part of it; and yet it is silently doing its fatal work: all the organs of the body are slowly being brought into a state of adaptation to receive it and to dispose of it; but in that very preparation they are themselves undergoing physical changes tending to the destruction of their function and to perversion of their structure. Thus, the origin of alcoholic phthisis, of cirrhosis of the liver, of degeneration of the kidney, of disease of the membranes of the brain, of disease of the substance of the brain and spinal cord, of degeneration of the heart, and of all those varied modifications of organic parts which the dissector of the human subject so soon learns to observe — almost without concern, and certainly without anything more than commonplace curiosity — as the devastations incident to alcoholic indulgence. Thus, the origin of such a report as that of Mr. Everett on the census of America in 1860, related by Dr. De Marmon in the "New York Medical Journal" for December 1870.

"For the last ten years the use of spirits has — 1. Imposed on the nation a direct expense of 600,000,000 dollars. 2. Has caused an indirect expense of 600,000,000 dollars. 3. Has destroyed 300,000 lives. 4. Has sent 100,000 children to the poor-houses. 5. Has committed at least 150,000 people into prisons and workhouses. 6. Has made at least 1,000 insane. 7. Has determined at least 2,000 suicides. 8. Has caused the loss, by fire or violence, of at least 10,000,000 dollars' worth of property. 9. Has made 200,000 widows and 1,000,000 orphans."

When I sat down to write this essay I

noted many points of peculiar scientific interest as deserving my attention, and amongst these one specially important, the question: — How alcohol, after it has been taken into the organism, is disposed of, whether by conversion into a new product by which it ceases to be alcohol, or whether, by leaving the body, as it entered it, an unbroken chemical compound? This question, however important scientifically, is of secondary moment when it is compared with the study of the direct regular, and almost unvarying action of alcohol upon the body during life, and I have therefore left it in order to place before the mind of my readers the actual influence of alcohol on the body of the animal that takes it, whatever may become of it after it has entered the body. In this effort I have shown how far alcohol is really good, and how such value as there is in it is limited at most to the first stage of its action; if I have shown how, being a so-called stimulant, it is not a giver of power; if I have indicated by what slight error in the use of it it is a destroyer of power of the most potent character; and if, from experimental research on the physiological action of the agent, I have been able to communicate to the world some facts not before rightly understood, my intention is carried out. I hope, moreover, the intention is carried out with benefit to the greatest of all social efforts, the effort to reduce alcohol to its legitimate application as an instrument for some good and most evil in the possession of man.

From The Saturday Review.
ENGLISH CIVIL WARS.

It is an old complaint that history is made up of crimes, and the complaint is so true that it draws near to the nature of falsehood. The proper answer to it doubtless is that, in this imperfect world, good is chiefly shown in its antagonism to evil, and that, where we have the richest crop of crimes, we have also the chance of finding the richest crop of virtues. Where there are no oppressors there can be no deliverers; where there are no enemies to withstand there can be no heroes or martyrs. If everybody else had been as good as St. Louis, St. Louis could not have been so good as he was. In such an angelic community his virtues must have been mainly passive; he would have had few or no temptations to strive against; the occasions for doing most of his best deeds would

In Sweden, the government control of the drinking-places is said to have resulted in great good ; so that Norway has already in many of its large cities, although not

of a mercurial course. But in order to secure good effects without evil consequences, or, rather, to reduce the evil consequences to the minimum, it is found that several points are to be attended to.

The first of these is to remember that the

yet in Christiania, set the same plan in operation. The method is original, and must be altogether shocking to our American Temperance Society folk: the Temperance Societies become the sellers of rum!

The municipal authorities of the large towns in Sweden, and first in Gottenberg, gave the whole liquor trade into the hands of certain societies composed only of the most respectable citizens. These societies buy wholesale the best—that is to say, unadulterated—liquor, and are in every way responsible for its retail. No intoxicating liquors can be sold except by vendors whom they have chosen, and who follow regulations drawn up by the societies and pay the latter a certain sum annually for their privilege. The regulations require that no intoxicating liquors are to be sold any evening after ten o'clock, or between five o'clock Saturday evening and nine Sunday morning. Great care is also taken to have food and such unintoxicating beverages as coffee and tea placed before the customers wherever brandy is sold. All the profits accruing to the societies which have control of the liquor trade are devoted to public and charitable purposes and institutions.

worthy of careful consideration on the part of those who are as much interested in the prevention of disease as in its cure.

Von Pettenkofer's views are essentially as follows. In order to guard a community against the introduction of epidemic disease, three means may be suggested: 1. The attempt may be made to exclude the epidemic influence, the "disease germs," by means of a rigidly enforced quarantine. 2. The endeavor to guard the individual may be essayed by the usual precautions of personal cleanliness, attention to diet, etc. 3. The locality may be purified, disinfected, freed from sewage, polluted water may be replaced by pure, and various similar precautions may be taken.

These provisions do not, of course, exhaust all the possibilities of precaution, but they indicate the chief directions in which this may be exercised. The outbreak of cholera in a given locality may be compared to the explosion of gunpowder by a lighted match. The match or the flying spark is harmless if the gunpowder be moist, or if any one of its constituents be wanting. Now, taking this view of cholera contagion, we have the "germ" as the ignited match or spark alighting in a town on a house where the situation and water may be good, but the drainage bad. Some, only, of the constituents of the powder being present, no explosion takes place. In another locality, strict quarantine may keep *almost all* of the germs out, the drainage is

A NEW TEST FOR ALCOHOL.—Dr. Edmund Davy, at a recent meeting of the Royal Irish Academy, described a new test for alcohol:—One part by weight of molybdic acid added to ten parts by weight of sulphuric acid forms a mixture, a drop of which, added to a solution containing alcohol, instantly detects it by producing a blue discoloration.

or the members of the Faculty at Ann Arbor, to fear from the homœopathists and a small following of students, which is sure to become less every year? Nothing whatever. No; let them rather stand manfully at their post of duty; let them have faith in their own profession; let them be true to themselves and to those under their instruction, and let time, 'the arbiter

FRENCH WINE-CROP OF 1875.—The French wine-crop has turned out greater than even the large statements of it hitherto. The *Moniteur Vinicole* gives the aggregate at 83,632,391 hectoliters, (2,209,381,398 gallons.) This is the largest yield ever realized, the next largest, that of 1874, being 78,124,424 hectoliters, or 2,063,875,408 gallons. In some parts of the field the dreaded *Phylloxera* still continues its ravages, and no specific remedy has yet been discovered. The insect has attacked the young vines planted to replace the old ones destroyed.

material, a great abundance of roots, but a depressed yield of the per cent of sugar, a greatly decreased export of raw sugar, and an increased export of the refined article. Later statistics show that for the three months closing with January the amount defecated was 919,386,147 pounds, against 765,094,496 during the same period of the previous year. The density of juice was 3.6, against 3.8 the previous year. The export amounted to 178,119,144 pounds, a falling off of 104,846,080 pounds compared with the same period in the previous year.

100 Measures of Wine, at 60° F. contain the following measures of absolute alcohol.

Port Wine	19.82 or 23.92
Madeira	17.91 or 22.61
Sherry	17.00 or 21.37
Claret (Bordeaux)	11.95 or 15.11
(Lisbon)	17.45
(Malaga)	15.98
(Malmsey)	15.91
Marsala	14.31 or 15.98
Champagne { Rose	10.45
{ White	11.84
Burgundy	13.34 or 11.06
(Hermitage { white	16.14
{ red	11.40
Trick	13.31 or 8.00
(Frontignac)	11.84
Cape Madeira	16.77
Muscat	17.00
Constantia	18.29
(Currant Wine)	19.03
(Grosbeerry Wine)	10.96

Elder Wine	}	9.14
Cider		
Perry		
Brown Stout		6.30
Me		8.00
Porter		3.89
Rum		49.71
Gallands		47.74
Whiskey { Scotch		50.20
{ Irish		49.91

Westmull

Alfred De Luse
Bordeaux.

Sauterne is near
Bordeaux.

Good Bordeaux wines
3fr to 8fr a bottle
when made.

Riesling grape, at
St. Emilion & Pomerol.
Pinot (or Pinot) grape
in the Champagne country.
This is a black grape.

Demi-mousseux, if
good, the best white Champagne.
Moët, Cluot, Reims, Remy
Piper, Perrier, Ginet. Moët



Liebig found Phosphoric Acid
bone to contain about
12 p.c. by weights &
15 p.c. by measure of
alcohol

Lindersdorf found Phosphoric Acid
medicines to have 7 to 9 p.c.
alcohol; acid, $4\frac{1}{2}$ to 6 p.c.



Chevallier — volume

Marsala — 23.83 percent.

Madeira — 20 — 20.52

Port 20

Constantia 18.17

Malaga 15 — 17.42

Ashmunien 15.16

Beaune blanc 12.20

Frontignan 11.50

Champagne 11.77

Hermitage rouge 11.33

Cote-Rôtie 11.30

Bordeaux rouge 10.10

Chateau-Lafite 9.33

Chateau-margaux 8.75

" Lafite 8.73

Chateau blanc 7.88



AMERICAN WINE.

The renewed war against alcohol has recalled attention to the possibility of avoiding the mischief of whisky by using our own wine. Curiously enough, Vineland is the name given to New England by the reputed Scandinavian discoverers, who were here in the year 1000. The Spanish and French discoverers looked for grape vines, too, and found them in Florida in 1564. The English settlers in Virginia were so successful that it was proposed in 1630 to introduce French vine growers and wine makers. In 1693, William Penn did his best to introduce vineyards here in Pennsylvania; in 1790, a colony of Swiss from the borders of the Lake of Geneva spent their time and money in trying to cultivate their foreign vines in Kentucky, and in 1801 they succeeded better at Vevay, in Indiana; but, after twenty years of trial, their vineyards became wheat fields. A Frenchman, Pierre Legrand, worked hard here at Philadelphia with French, Spanish and Portuguese vines, but to no good; two other Frenchmen met the same or worse fate, first in Texas and then in Alabama; and others tried it in other States in succession, but always with the same result, which was carefully recorded by our late well-known citizen, Mr. Elias Durand, in the journal of the Paris Society for Acclimating. Our native grapes have, however, proven themselves much better suited to the purpose, and American grape vines must supply the future demand for American wines. The first effort was made with the Schuylkill grape, which was found on the banks of our river by the gardener of Governor Penn, before the Revolution, of course; it also bears the name of the discoverer, Alexander. The Catawba was known as far back as 1796 to the French travellers and exiles who settled near the present site of Cincinnati, where in 1823 Nicholas Longworth began its use for the wine which is now almost world-wide in reputation. In 1870 there were 10,000 acres of vineyards in Ohio, producing 155,000 gallons. The Isabella was named after Mrs. Isabella Gibbs, who introduced it in 1818, the Concord from the town in Massachusetts where it was first grown. All of these have been useful in turn, and have been succeeded by many others in building up the vineyards of the West, Kentucky, Indiana, Missouri, Illinois, while in the South Georgia and North and South Carolina, and California have all helped to swell the total production to fourteen millions of gallons in 1871. The whisky crop was sixty millions of gallons, so that with all the help of foreign wines it will be long before the supply of the less dangerous and more wholesome beverage can supercede the "strong drink."

R.

CENTS PER WEEK.

SCHOOL DEDICATION.—The Mount Vernon Grammar School house, on Catherine street, above Third, in the Third Section, is dedicated with appropriate exercises to evening. It is an elegant building of brown stone, with dressings of serpentine, having a front of 60 feet and a depth of 160 feet, and being three stories high. There are 12 class rooms, and 3 reception rooms, and 2 teachers' rooms, and one for the meetings of the Board of Directors. The building will accommodate 1200 pupils, the lower floor being devoted to the primary classes, and the second and third floors to the boys' and girls' grammar classes. A large audience assembled at the schoolhouse last evening to witness the dedication, and among the number were members of the Sectional Board and of the Board of Education, together with many others interested in the cause of public education.

After an impressive prayer by the Rev. C. Cummins, Washington J. Jackson delivered an interesting address. He said that the large and beautiful building they were about to dedicate occupies the site of old Mount Vernon School House, which was erected in 1821, and which in its day was among the finest in Philadelphia. As an evidence of the progress made by the city in the cause of education, the speaker drew a comparison between the public schools fifty years ago and those of to-day. At that time the number of pupils taught in the public schools, as they were called, numbered but 10, now they fall but little short of 90,000. The whole expenditure for school purposes in 1821 was but \$19,000, while last year the amount reached the large amount of \$1,449,000. Mr. Jackson's address was interesting throughout, and was listened to with much attention.

He was followed in a few remarks by Mr. Hall Stanton, President of the Board of Education, and, after some beautiful vocal music by a class of grammar school pupils under the direction of Prof. Aug. Perrot, Superintendent of Music, in which marked proficiency was shown, Hon. James Ludlow delivered an eloquent address on the subject of education, giving to it a prominent place in the elevation of the human species to the highest point of social, moral and religious advancement.

The exercises were interspersed with recitations and addresses by the pupils, and musical selections, those participating being

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California.

Nov. 18, 1874

THE vintage is now so far advanced that a very good idea may be formed of the yield of the vineyards of the State. The wine-makers of the State have been already busy for about six weeks, and by the end of the month they will have finished operations for the present year. The result of their labors will then be the production of about 8,500,000 gallons of wine, divided about as follows:

Los Angeles and San Bernardino.....	1,500,000	gallons
Sonoma.....	1,000,000	"
Napa Valley.....	800,000	"
Sacramento, San Joaquin, Yolo, Solano.....	2,200,000	"
Tuolumne, Placer, St. Barbara, St. Clara.....	1,700,000	"
Tehama	300,000	"
Other Counties.....	1,000,000	"
Total.....	8,500,000	"

Besides this, there will be manufactured 200,000 gallons of brandy.

This is far ahead of any previous year's yield; and the first question that suggests itself to those interested is, where can a market be found for it? It cannot be sold in the State at present; it must consequently be exported. And we are informed that two-thirds of the whole vintage will be so exported. Of course the greater part of it will find a market in New York, but an attempt will be made to open out markets in England and Germany also. In this way, no doubt, the greater part will be easily got rid of, but at reduced prices. Se

you will give to each an-
tion.

The following gentlemen were named as a committee to consider the subject of changing the tariff: Chas. McK. Leoser of Messrs. Isaac Smith's Sons, Johannes Lienau of M. Lienau & Co., Alex. Shaw of Galwey & Casado, H. G. Schmidt of H. G. Schmidt & Co., A. L. Myers of Lawrence Myers & Co. As a committee to suggest a change in the present mode of collecting duties and grievances, the following gentlemen were appointed: R. Mackie of Barclay & Livingston, M. J. Fassin of M. J. Fassin & Co., Wm. E. Booraem, Chas. C. Kross of Clement Heerd & Co., and Geo. J. Muller.

Occasional Notes.

MR. JOHN G. TURNEY, representing the well-known firm of M. B. Foster & Sons of London, England, who has been on a visit to this country, left New York on the 7th inst. for Europe, by the White Star Line steamer *Oceanic*. The many friends Mr. Turney made during his sojourn among us will no doubt be gratified to learn that he has been unusually successful in the pursuit of his business in this country. Mr. Turney has during his short stay made contracts

11
With the common use of light wines as a beverage, California wine-growers need never be troubled about finding a market, and a home market, for her wine product. France consumes the most of the product of its vintage; its population falls short of that of the United States; its people are poorer, they are one of the most temperate people of Europe; they manage to dispose of 52,000,000 litres, or 1,144,000,000 gallons of wine yearly, between home consumption and export. To raise this in California would require the cultivation of 2,160,000, or nearly three million acres. Therefore, to find a market for an increased product, the wine-growers of California have to educate the people of the United States to the use of light wines as a beverage, in place of beer, ale, etc. This would not only benefit California, but would be a better aid to temperance than all the local option arguments in the world.—*San Francisco Journal of Commerce.*

extraordinarily low price, but to enter English ports the duty is 250 per cent. of the value, no doubt fixed with the intention of preventing their introduction into the United Kingdom. As another specimen of tariff, wines of a weaker kind, and containing artificial constituents which render them dearer, are permitted to enter British ports at a duty of 12 per cent. and less of the value.

The Spanish "Vin Ordinaire" is the healthiest drink for the alimentation of the people, and possesses a larger quantity of hygienic qualities than those wines generally consumed by the rich. This satisfactorily explains how it is that the good wines of Spain, very common where produced, and, being generally consumed, are the delicacies of travellers, cannot possibly be found, and are totally unknown in British markets. In consequence of the demand for some of these wines by persons in England who have tasted them in Spain, and the growing desire to imitate them, the merchants have procured inferior sorts by mixing with wine

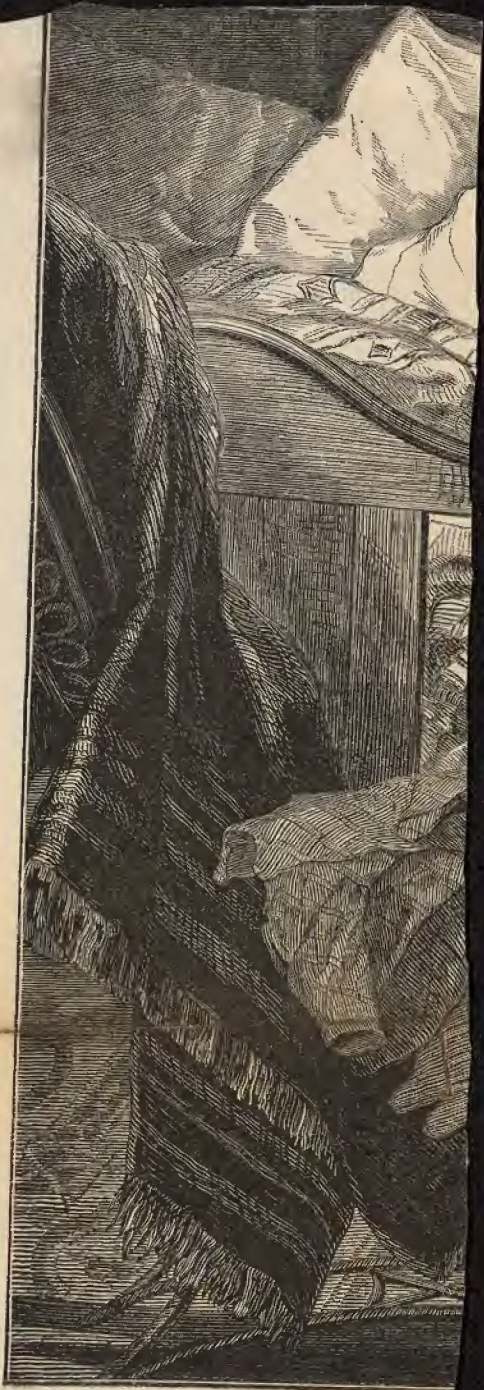
The Vineyards of California.

BY F. B. PERKINS.

WITHOUT a doubt California is soon to be the great vineyard of the world. Every indication conspires to favor this result. The steep hillsides, which form so characteristic a feature of the territory, and many of which are almost if not quite valueless for other purposes, are found to be no less fitted than the bottom lands for this crop. Wherever chaparral and manganita will grow, the grape can be domesticated. It does not, like wheat and other cereals, require irrigation. After twelve months at the most no artificial moisture is needed. By that time the roots will have shot down far enough to supply themselves with water. Instances are known in which they have penetrated gravelly soil to a depth of thirty feet, and half that distance in cement. The equable climate also affords great advantages. During all the season of fruit-growing there is an entire absence of those weather changes which elsewhere affect the quality of the fruit unfavorably. In Europe *e. g.*, seven out of ten crops are failures. In California, on the other hand, says Mr. Harazthy, the variation in quality seldom amounts to five per cent., nor do the worst years diminish the quantity more than twenty-five per cent. Such moreover is the dryness of the climate, that weeds once cut down will not spring up again during the season, thus diminishing the labor of cultivation; nor is the fruit in danger of mildew. To the favorable conditions of climate also, is due the possibility of growing vines upon better land than in Europe. While partly because of the superabundant vitality of the soil the ravages of the dreaded phyloxera have not been so severe as elsewhere.

If then to all these advantages be added considerations of the profitableness of vine-culture, the opinion, that California will yet be not less distinguished for this than for its mines, can hardly be deemed extravagant.

Already its grapes for table use have won for themselves fame and a ready market abroad as well as at home. Their culture for the manufacture of raisins is also car-



California Mine

ried on to some extent, and will become a more important feature of the industry. Thus far however and probably always, the principal stimulus to production will be their value for wine. Of this there was manufactured during the last year, 3,858,027 gallons, besides 175,944 gallons of brandy; while the product of the vintage just closed will not fall short of ten million gallons.

Wine-making as well as grape-growing was carried on at the Catholic missions. It was however a crude process and the product poor, bearing little resemblance to more recent vintages. A brief sketch of the operation as now conducted may be of interest.

The land is purchased at from \$30 to \$150 per acre before planting; farms varying in size from thirty-five to eight or nine hundred acres. The vines planted in rows 6x4 feet apart, 1,000 to 1,800 to the acre. They are not staked, but kept pruned to within three feet from the ground. Besides the blue Mission grape, the principal varieties are the Rusting, Orleans, Chaselas, Miller Burgundy, Malvoisie, and Trifendel.

The vintage begins early in September and continues until the last of October. The picking in Northern California is done by Chinese, at an expense of one dollar a day without board. Each man will gather an average of 1,500 lbs. daily. In the Southern counties Indians take the place of Chinese as laborers.

The grapes as picked are put into light wooden boxes containing about fifty pounds each, and are thus taken to the press-house. Here they are emptied upon a screen, through which the grapes fall and are crushed between two revolving rollers. Passing from these, the bruised mass is received upon an inclined platform, which allows a portion of the juice to flow off into casks. It is then placed under the press where the rest of the juice is forced out; this added to what came from the crusher is allowed to ferment, a process requiring about fifteen days. During fermentation the cellar is kept at a temperature of 65 or 70 degrees Fahrenheit, afterwards from 50 to 60 degrees. The wine is now made, but the real difficulties are just beginning. It is the subsequent treatment which demands most care and skill. Here is where the long and patient training of the wine-maker becomes of service. He leaves the wine upon the lees until the first of January, when it is drawn off into clean casks, and again a second time in March. After this it remains undisturbed for two years or more, unless sooner sold to the wine merchants of San Francisco.

Light wines, like hock or claret, are made from grapes just ripe; the heavier kinds, sherry, angelica, port, and the like, are made from grapes which have been allowed to become overripe; the water thus evaporating and the juice becoming thick and saccharine.

The difference between white and red wines is consequent upon the length of time the juice remains in contact with the pulp after crushing. For white wines, as hock or sherry, the juice is allowed to run off at once; while red wines, such as claret or port, are made from juice which has remained for twenty-four hours in contact with the skins, upon the inner coating of which the coloring matter resides.

Sparkling wines, like champagne, are subjected to another process in which pure sugar syrup is added.

For the manufacture of brandy the pressed skins are ordinarily used. Thrown into a vat and covered with water, they are allowed to ferment, the liquid being afterwards distilled. Gen. Negley in San José, however, who makes a specialty of brandy, employs for this the entire juice of the grape.

The price of grapes suitable for wine-making is about \$15 per ton for Mission, and \$25 per ton for European varieties. The cost of manufacture is from ten to fifteen cents per gallon, and the prices obtained for the wine, claret and hock forty-five to seventy-five cents, port eighty-five cents, muscatel \$1 00, sherry \$1 10, and angelica \$1 25 per gallon.



But no illustrations can convey the sense of exhilaration as one swings up and up and up behind the panting leviathans, over the dark valleys, and round the projecting mountain shoulders. The forces of nature seem to bend themselves submissively to the hand of man. He is the monarch, and the railway train is his thunderous chariot.

Still up we go, climbing the crest of the great Appalachian chain. Is there anything much finer than the prospect at Allegrippus? To the eastward range after range is seen, melting away into the blue of the horizon. We are at such an elevation that these ranges present the appearance of a rugged plain, but it is one of the "divides" of a continent. Here is a little rivulet which will soon leap into the Juniata, and thence into the Susquehanna, and so into



MSS 2/0030-1 UNIVERSITY OF PENNSYLVANIA -- AUXILIARY FACULTY

SER. 4.4 LECTURES - HYSLOP

(2b) VOL. 1 -- ADDITIONS (iv)

[1866-1876]

1

Dr. H. J. Bowditch of
Boston, as the result of ex-
tended investigation, asserts
that while some stimulants are
used in all quarters of the globe,
intemperance is rare between
the isothermal lines of 77° North
South of the equator. (82.4°)

Gradually increases to 50° isotherm line;
beyond that is very rare and
productive of crime. Race is im-
portant; English have spread it south-
ward. In winegrowing and lager
beer drinking countries drunkenness is
not common. Dr. B. approves of the
culture of the vine & the use of beer,
with prohibition of ardent spirits.

See R. Chandler's report, — French prisons, alcohol
no definite relation to crime; England, constantly close,
Education he also rates

very high as against intemperance.

Inebriate acts should be gen-
-erally established for methomanias
& "repented drunkennes should
be punished as a crime." "The

seller of liquor to a known drunk-
-ard should be signally punished,
& the offender should be made to pay
the expenses of cures or injuries re-
-sulting from the intemperance
of the victim." Cheap coffee-

houses should be provided ev-
-erywhere, to compete with drink-
houses, Prohibitory laws Dr. B.

think have not been found to lessen
drunkennes, though they may prevent
"open bars." See R. Chandler's
Report, 1872.



Philadelphia, Wednesday, April 19, 1871.

STATISTICS OF DRINK.

The Second Annual Report of the State Board of Health of Massachusetts contains some curious statements as to the quantity of intoxicating liquors consumed abroad, and its effects on the crime, health and prosperity of the various nations therein mentioned. These statements have been obtained from American ambassadors and consuls who have had opportunities of witnessing the effects they describe, and the result will probably astonish both sides of the "temperance" question. Indeed, considering that the Board took the trouble to collect the facts referred to with a view to sustain prohibitory legislation, it is somewhat surprising they should have published what will tend to defeat rather than to assist their aims. The reader will draw his own inferences; but it should be borne in mind that as regards drinking in this country, its evil effects are patent; and that while it is possible that the moderate use of intoxicating beverages may be harmless, or even beneficial in some climates, they are injurious in this.

In Italy every man drinks wine, and some drink foreign wines, brandy, rum and beer; but intemperance is not a prominent evil. Consul Rose, of Ancona, Italy, says that crime committed under the influence of liquor is unknown there. Mr. Tuckerman, of Athens, Greece, says that in that city, containing 50,000 inhabitants, only 42 deaths had been occasioned in ten years by strong drink. Intemperance is very rare in Greece. In Switzerland they drink beer and wine, but no trouble arises from it. The finest men come from the wine cantons. The peasants drink schnapps and potato brandy, and these cause trouble, especially when the poor do not get enough food. Mr. Bancroft states that the health and prosperity of the people are not injured by beer and schnapps. At Bremen wine and beer are used in unlimited quantities by all classes without evil results; but at Cologne 75 per cent. of the crime is traced to hard drinking, and at Trier the 51 criminals in the prison were all hard drinkers. In Ireland whisky, wine and beer are largely consumed. The popular drink is whisky, and almost all the crime of the country is charged upon it. In 1868 76,000 persons were arrested for drunkenness. The consumption was 5,030,814 gallons of domestic spirits, and 325,995 gallons of foreign spirits, with 1,208,233 gallons of beer and 1,538,209 barrels of wine, costing in all \$40,813,785, or an average of \$37 50 for every family. But England and Scotland are no better. The consumption of these two nations in 1869 was 15,151,741 gallons of foreign wine; 29,407,499 gallons of spirits, and 896,553,056 gallons of ale and beer. Cider is also largely used, but no return is given of the quantity. Three-fourths of all the crime in Great Britain springs from drink. In the Netherlands, where large quantities of schnapps and gin are consumed, fifteen-sixteenths of the crime is traced to these fiery liquids. At Odessa, Southern Russia, wine, brandy, beer and ~~whisky~~ ^{brandy} are consumed; the latter article is sold at five cents a gill, and it occasions about three-fourths of the crime. At Cadiz the people drink sherry wine, Burgundy and aguardiente (diluted alcohol), but according to the report no crimes are attributed to this cause. Denmark presents some curious features. There, the aggregate consumption of intoxicating beverages has increased within the last twenty years, but the number of cases of intoxication has decreased. With a population of 1,600,000 the consumption is 6,762,000 gallons of foreign and domestic liquor. There has been a slight increase in the number of suicides, and in diseases of the liver, bowels and kidneys. In the country the laborers have five meals a day, and two glasses of rum with each meal. Yet Mr. Yeaman, the American Minister, says that there has been improvement in education, agriculture, land tenure and political power, among the people.

Another Danish correspondent says that the annual average consumption is $4\frac{1}{2}$ gallons a head, but it has no injurious results. At Frankfort-on-the-Main, wines, beer, cider and brandy are drunk, but intoxication is rare, and few offences are committed and good health prevails. At Geneva, absinthe and cognac brandy are the favorite drinks, but there is little intoxication or crime. Lepsic, with 95,000 inhabitants, consumes 400,000 gallons of beer, and 150,000 gallons of wine annually; about 8 per cent. only of the arrests are for drunkenness; the percentage of crime is small, and the public health is good. In Madeira, Malta, Beirut, Ceylon, Japan, Egypt, Arabia, Zanzibar, Hayti, Nicaragua, Santa Cruz and Peru intemperance is reported to be almost unknown, and the health of the people good, although wine and a great variety of spirituous and malt liquors are used. The report from Lima states that all sorts of European and native wines and liquors are consumed there, but that in six years only one case of assault and five homicides have occurred among a population of 180,000. At Para, Brazil, though there is a drinking house at every corner and everybody drinks, the Consul saw only two drunken persons during six months. At Pernambuco, rum is sold at 40 cents a gallon, but nobody drinks to excess. Austria and Hungary stand favorably with regard to temperance; but drunkenness has been greatly on the increase in France for some time past, and has been productive of much of the suffering the nation has undergone. Toronto, Canada, drinks everything, and intemperance is charged with 98 per cent. of all the crimes. These contradictory statements deserve serious consideration; but it may be safely said that, if all the money spent in war, tobacco and drink were expended for education, sanitary improvements, public works and for other useful purposes, the world would be infinitely better off.

THE COURTS.

U. S. CIRCUIT COURT.—Judge McKennan.

In the case of *Beck vs. Dornan*, which was an application for an injunction, the motion was refused.

Royle, Administrator, vs. Griffith.—On motion the bill was dismissed for want of prosecution.

In the case of the *Same vs. Bozerth*, there was a similar disposition.

Fertenbaugh vs. Baskins.—This case was before the Court on final hearing.

The case of the *Pennsylvania Salt Company vs. Thomas* was under argument at the adjournment.

U. S. CIRCUIT COURT.—Judge Cadwalader.

The case of *Thomas Cochran vs. William Young*, which was an action on a promissory note, was tried. Jury out.

In the Bankrupt Court, before Judge Cadwalader, the case of *Charles C. & Joseph Petit* was called up and a jury empanelled, when the Court adjourned. The question to be tried was whether the defendants committed an act of bankruptcy.

NISI PRIUS.—Justice Sharswood.

Rose, et al. vs. Hart, et al.—Bill dismissed, and each party to pay their own costs.

The Commonwealth, ex. rel. Walter H. Tilden, Charles B. Stewart, J. Douglass Brown, Charles Sloan, John Huggard, William A. Rollin, Henry N. Barnes, Elias L. Boudinot, Samuel Ritchie, Francis D. Wetherill, Michael Arnold, et al., and William S. Johnston, vs. John Lambert, Henry S. Lowber, P. Pemberton Norris, Henry Henderson, Henry Norris, George N. Allen, Henry C. Thompson, James Dougherty, Charles Pancoast, Francis R. Abbot, Edward Borhek and T. Franklin Cooper. Suggestion for a writ *quo warranto*.

The relators alleged that the respondents have exercised since the 10th of the present month, and still do exercise without lawful authority the right, privileges, &c., of the vestry of the rector, church wardens and vestrymen of St. Clement's Church, in this city. They further charge that the said vestry is a body corporate, the charter being approved in 1835; that the regular annual election for the vestry of the said church was held on Easter Monday last, April 10th, and that thirty-six persons voted, their votes being received by John P. Brock and Henry C. Thompson, the judges of said election; that the judges received the votes of G. W. Hunter, C. Pancoast, Henry S. Lowber and J. A. Meade, which were cast for the respondents, notwithstanding that those persons were not entitled to vote, and against an objection made by duly qualified persons to the said judges against the reception, before they were counted, of the votes of three out of the four of said persons, on the ground that these three were not members of the church; that in addition to the thirty-six persons who did vote, Rev. H. G. Batterson, the Rector; W. H. N. Stewart, the assistant minister; E. L. Boudinot, Mrs. Thaddeus Norcross, Emily B. Freeman and Thomas G. Lowell, members of the church and duly qualified to vote at said election under the charter, sought to vote for the relators to vestrymen, but their votes were rejected by the judges of the election; that of the 36 votes there were only 32 members of the church duly qualified under the charter to vote; that the 32 qualified voters, 15 voted for the respondents and 17 voted for the relators to be vestrymen, they being duly qualified to perform the duties of vestrymen; that these 17 persons were a majority of the members of the church, who appeared by the vestry books of the church to have paid two successive years immediately preceding Easter Monday, 1871, or a pew in sitting in the said church, who being so qualified, did vote at said election; that the relators were therefore elected, but notwithstanding, the judges of the election having rejected the votes of the six members before mentioned, added the four votes of the disqualified voters, and wrongfully decided that the respondents were elected to be vestrymen for the period of one year from the date of the election and caused them to be notified accordingly, and so it is that the respondents have since Easter Monday, and still do, exercise the rights, &c., of the vestry of said church.

The writ was granted and made returnable on the first Monday of May.

DISTRICT COURT, No. 1.—Judge Stread.

Brown vs. Morgan, Orr & Co..—Before reported. Verdicts for plaintiff, \$1206 80, \$391 06 and \$385 43.

John Lauck vs. David M. Sellers.—An action brought alleged to be in arrear. Verdict for plaintiff, \$124 20.

Ransom Rogers vs. Christopher Cronshaw.—An action to recover commission on the sale of real estate. Nonsuit.

The Cecil National Bank, Md., vs. Abraham Eyre.—An action on a promissory note. Verdict for plaintiff, \$243 65.

Geo. A. Boker & Co. vs. Same.—Same kind of action. Verdict for plaintiffs, \$171 78.

DISTRICT COURT, No. 2.—Judge Land.

Wm. White vs. Jas. Montgomery.—An action to recover commissions on the sale of real estate. Verdict for plaintiff, \$20.

Levenson, Brothers & Co. vs. James and John Armstrong, trading as James Armstrong, Jr..—An action to recover for coal oil sold and delivered. Defendant set up no partnership. Verdict for plaintiff, \$277 18.

Erred Evans vs. Emanuel Marks.—An action on two promissory notes. No defence. Verdict for plaintiff, \$707 93.

Same vs. Chas. A. Weckerley.—Same kind of action. Verdict for plaintiff, \$707 93.

COMMON PLEAS.—Judge Pierce.

Philip Doerle vs. William Johnson.—An action against a surety. Verdict for plaintiff, for \$3.

Michael Hoben vs. The St Philip de Neri Official Society.—An action to recover benefit. Jury out.

A special injunction was granted by Judge Price, to continue for five days, in the following matters:

The City of Philadelphia vs. The Thirteenth and Fifteenth St. Passenger Railway Co.—The act sets forth the act of incorporation of the defendants, April 8, 1859, for Thirteenth and Fifteenth streets, with connections by way of Columbia avenue and Carpenter streets, and a supplement of April 4th, 1868, to extend tracks on Thirteenth and Fifteenth streets. It then recites the act of May 16th, 1861, creating the Navy Yard, Broad Street and Fairmount Railroad Company; that the act of the corporations have commenced construction of this road until within a few weeks past; that the last named corporation is made subject to the ordinance of Council, and the charter has become null and void, as the road was not commenced within three years, nor have the ordinances of Council been complied with; that there is an ordinance prohibiting the removal of cobblestones without a permit from the Highway Department; that no such permit has been obtained for the purpose of removing the cobblestones from Broad street, between Wharton and Spring Garden streets; that all franchises granted by the act of May 16, 1861, have long since lapsed by non use; that the Thirteenth and Fifteenth Streets Railway Company claims, by a pretended agreement with the Navy Yard, Broad Street and Fairmount Railroad Company, and by authority of an act of Assembly of May 16, 1861, to acquire the right to lay a double track way upon Broad street, from Wharton to Spring Garden street; that the Navy Yard, Broad Street and Fairmount Passenger Railway Company was never organized according to its charter, the provisions of the act of Assembly, of February 19th, 1849; that notice of the opening of subscription books given by five of the commissioners of the

Don't copy

Statutes in connection with climate influence

Statutes in connection with climate influence

Correspondence.

MEXICO AS A RESIDENCE FOR INVAILIDS.

LETTERS FROM PROF. E. R. PEASLEE, M.D.

III.

CITY OF MEXICO, March 14, 1876.

MR. EDITOR:—In order not to trespass too far on the space of the RECORD, I now close what I have to say from this point of observation with some very miscellaneous remarks. So far as the habits of the people of the Mexican basin, respecting food, are concerned, I have nothing to remark; except that the Indian population (descendants of the Aztecs) live and labor hard upon a surprisingly small amount, and this consisting in great part of fruits not regarded as containing much nutriment. They seldom take meat, but, instead, use beans, and Indian-corn ground upon stones by the women and made into tortillas, without any admixture of lard, butter, or salt. But of a particular drink, used by almost every one in the Mexican basin, I should speak more at length. This favorite beverage is called pulque (pronounced pool'kay); and it is found that a pint a day at least is used, on the average, by every man, woman, and child in the city of Mexico; amounting, for a population of not over 250,000, to more than 31,000 gallons a day. Special trains, laden with pulque alone, are sent daily to the city, and it is brought in from all other parts not reached by railroad, in carts, or on the backs of mules. It is seen everywhere, it is everywhere smelt, and is everywhere being drunk, though the lower classes alone are seen to drink it by the tourist, as he traverses the streets; the educated class, however, drinking it equally at home. The single railroad terminating in Mexico receives \$900 a day for the transportation of this liquor, the greater part of it being produced within 50 miles of the city. There are immense estates (haciendas) which produce nothing but pulque, and this is found always to be a lucrative business. This drink is the fermented juice of the maguey-plant, as it is here called—the Agave Americana, or century-plant,—a species of cactus. It has the appearance of milk, with the taste of sour butter-milk; and to which another very disagreeable taste is added, and a smell still more disagreeable, owing to the fact that it is, to a great extent, transported in hog-skins. Very evidently one must learn to like it. A quart is sold for from 3 to 5 cents, and this amount is not seldom swallowed by the drinker within 5 to 15 minutes. Used in great excess, pulque produces intoxication; and a distinguished Mexican judge remarked that the greater number of crimes implying violence, in this part of the country, are committed under its influence. On the other hand, it is generally regarded as quite nutritious, and seems much to resemble whey in this respect. Pulque is produced in the following manner: The maguey-plants are set 10 feet apart, in rows 20 feet apart, and require 6 to 7 (sometimes even 15) years to attain to the required maturity; when they are 4 or 5 feet high, and of the same diameter, as measured across their long, thick, and very succulent leaves; which radiate in all directions from the bulb or stump, 12 to 18 inches above the ground. They are 40 or more in number, and a single leaf has been found to weigh 160 pounds. When the plant begins to shoot up a flower-stalk, the latter is cut off, and a

cavity is scooped out of the stump below, holding one to four quarts, according to the size of the plant. The juice exuding into this receptacle is collected daily by means of a pipette on a large scale, which takes it up by suction and transfers it to the vessel receiving it. The inside of the cavity is then lightly scraped, to excite further escape of the fluid; and thus being constantly increased, it often finally becomes larger than the largest bucket. This treatment exhausts the plant in six to seven months, during which time it may have yielded 8 oz. to even 2 quarts daily, or an aggregate, sometimes, of 100 to 200 gallons. Some have stated the possible amount to be 400 gallons for a single plant. The juice, thus collected in vessels or in hog-skins, is either retained in the latter or poured into a tank, and in 48 hours or less fermentation is completed, and the pulque is ready for the drinker. It can, however, be kept but seven or eight days, when another change occurs, rendering it useless; hence it cannot be exported from the Mexican basin. It is sent to the city, to a great extent, in the hog-skins, but partly also in casks.

patient did badly, but at the time of making the report her condition had much improved.

DR. DELAFIELD, to whom the tumor had been given for microscopic examination, reported that the sac was composed merely of connective tissue and spiculae of bone. The gelatinous substance adhering to the inner wall of the sac was composed of basement membrane, partly fibrillated, partly granular, and partly hyaline, in which was imbedded round fusiform and stellate cells, which resembled those of hyaline cartilage. It seemed to be a tumor composed of cartilage tissue, with an excess of cells, a considerable admixture of ordinary connective-tissue cells, and belonged to the class called chondro-sarcoma. In regard to the prognosis of these tumors, he remarked that it was very uncertain, some had never returned, and others had made their reappearance with great rapidity. Although in that particular instance the prognosis was bad enough, the case was nevertheless not absolutely hopeless.

A SYMPTOM OF BONY TUMOR.

DR. MASON remarked that there was one feature in

evening rise. During this time she never complained of any pain; in fact there was no other symptom except the moderate degree of fever.

The night before she died she got up and appears to have lain on the floor ten hours. The next morning, six hours after the occurrence, she was seized with a violent chill, followed by fever, from which she died in twelve hours.

At the autopsy there was a great quantity of flakes of pus lying over the great omentum. The peritoneal vessels were injected, but the intestines were not agglutinated. Half a pint of liquid pus was found in the cavity of the pelvis, but there was no exudation over the peritoneal surface of the uterus, neither was there any evidence of inflammation of that organ. This was the only interesting point—the left ovary was covered with a purulent exudation; and notwithstanding it had been for a long time immersed in hardening fluid, it was, compared with its annexa likewise treated, almost disintegrated. The Fallopian tube was filled with puriform liquid up to the opening in the uterus, but not beyond it. The internal surface of the uterus was healthy. A chain of retro-peritoneal glands, extending from the pelvis very nearly to the diaphragm, were enlarged and covered with pus, seeming to point to a direct infection from the inflammation of the left ovary. The interpretation of the case was, that the first fever, lasting a few hours, was connected with inflammation of the left Fallopian tube; that it proceeded by continuity to the left ovary; after that, the inflammation was arrested, and coincidentally with that arrest the fever fell; but the retro-peritoneal glands were slowly infected; thus constituting the channel by which the blood was poisoned.

STRICTURE OF SMALL INTESTINE.

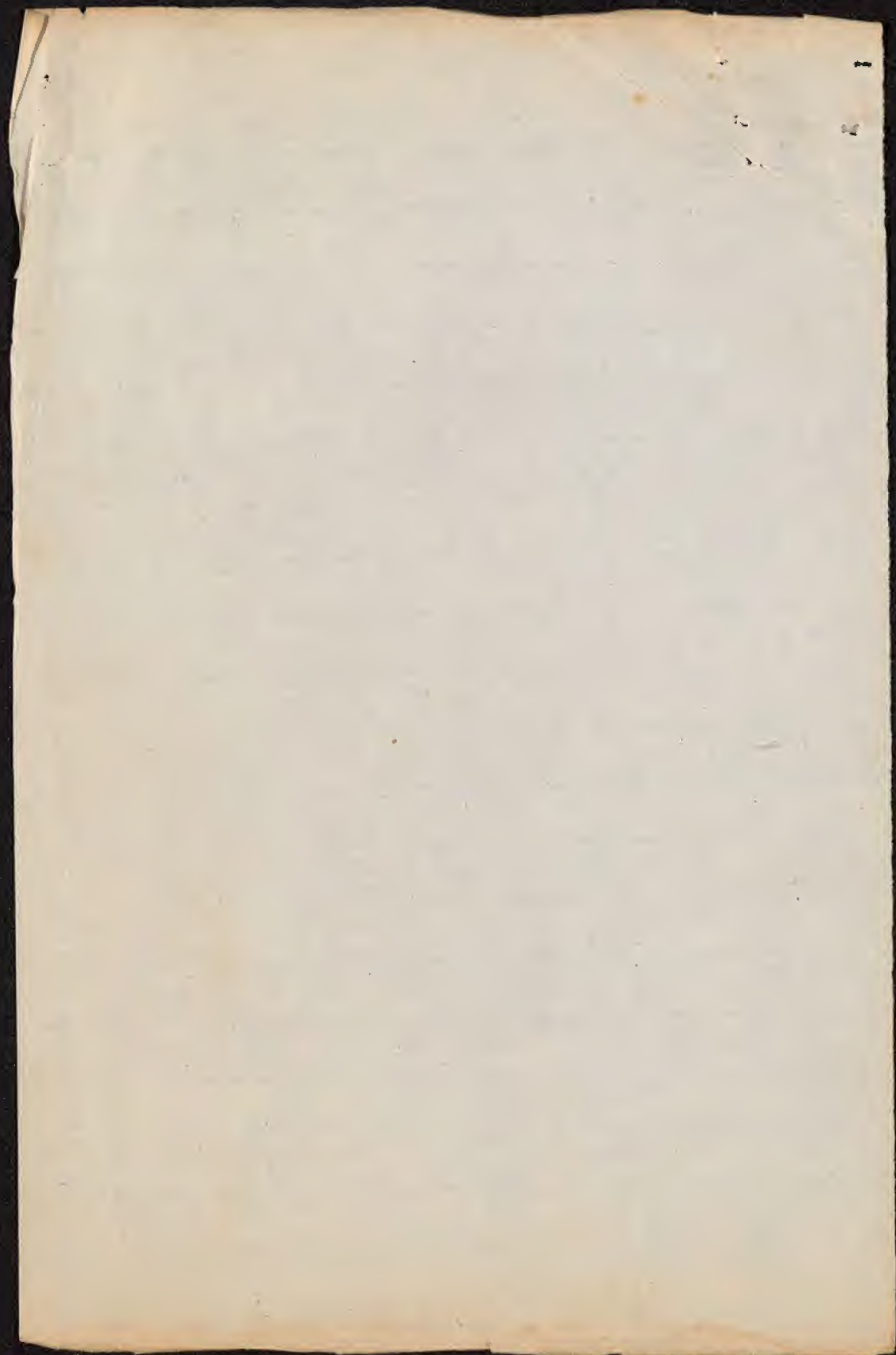
DR. SATTERTHWAITHE presented a specimen of stricture of small intestine taken from an Irishman aged fifty years, a patient of Dr. Hadden. The patient was taken sick in February last with some bladder trouble. In the course of the treatment, Dr. Hadden's attention was directed to a strangulated hernia. This was reduced without any special trouble, but immediately afterwards the patient was seized with peritonitis in the course of two days, after which he died.

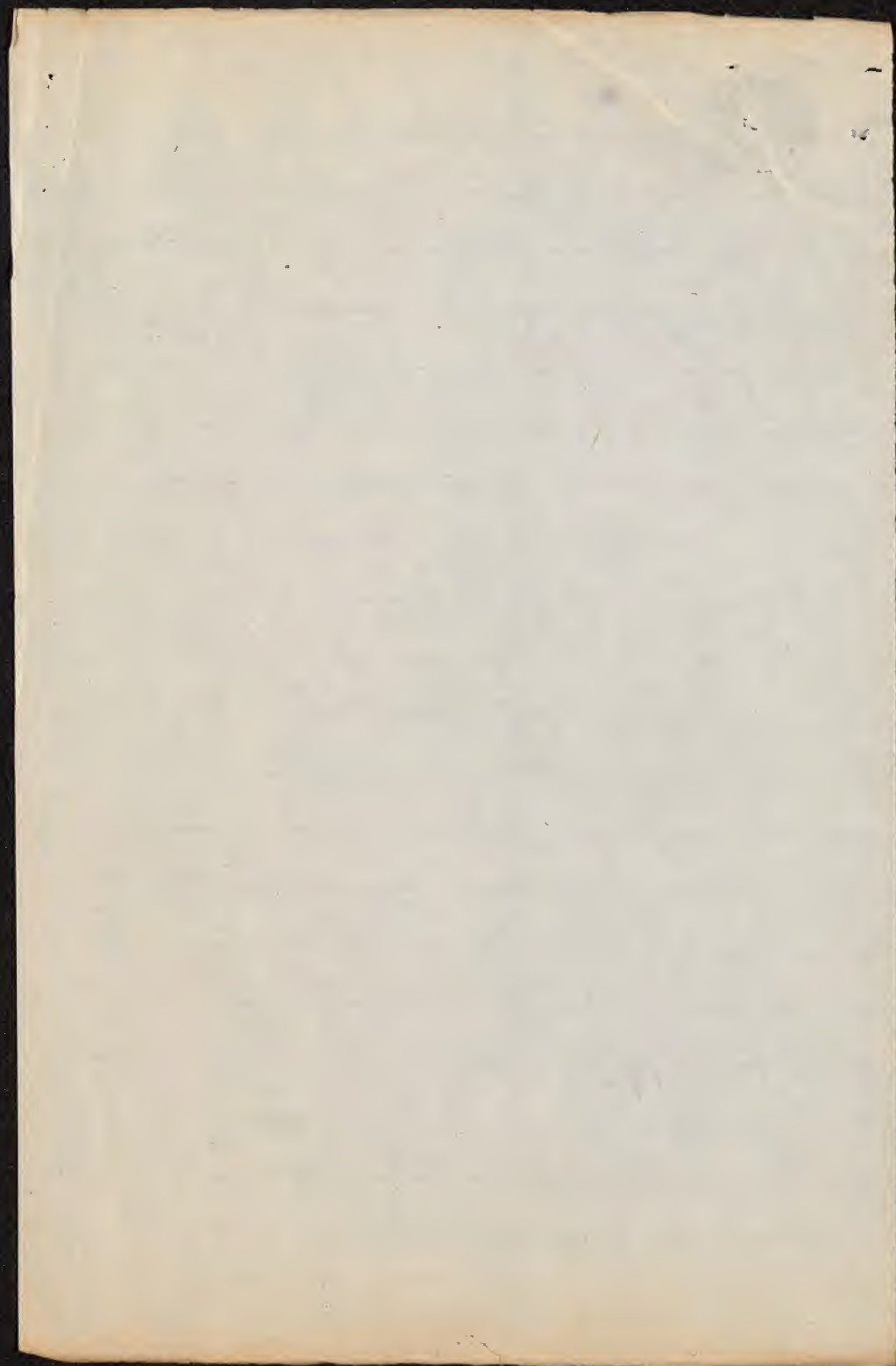
The autopsy, which was made by Dr. Hadden, revealed general peritonitis. At the point where the hernia had been reduced the intestine was hardened, inflamed and congested, and marked the situation of the stricture. In fact, three strictures were discovered at this point. The lower one was twelve inches above the ileo-cæcal valve, about three inches above this another, and three and a half inches a third. The middle one was very tight, not admitting the little finger. Between them the intestine was deeply congested, and in some places the mucous membrane seemed to be eroded.

THE PLAGUE in Mesopotamia is increasing. At Hillah, from April 1 to 7, inclusive, 114 persons were attacked with the disease, and 56 died. On April 8, there were 22 attacks and 13 deaths, and on April 9, 31 attacks and 11 deaths. At Bagdad, from April 2 to 8, inclusive, there were 256 attacks and 169 deaths; on April 9, 74 attacks and 18 deaths, and on April 10, 56 attacks and 26 deaths. The highest number of cases registered in any single day was on April 9. Cases have occurred in the military hospitals and garrisons.

(*)
Use of spirits being
obviously unsuited to health
& the ordinary conditions of life,
are there exceptional ^{circumstances, not of illness,} ~~ones~~ under
which they are advantageous, where
else or when would not be?

If any, & extreme cold. —
But Sir J. Richardson, Mr. Enderby, Dr. King,
of English expeditions, & Dr. Kane &
Hayes of ours to the Arctic Ocean; &
Dr. Hooker to the Antarctic, — all aver
that good assens power to endure
cold. Hudson's Bay Company forbid
spirits to their fur hunters. Quills at
Chamouni & elsewhere among the Alps, find
they are better in coldest weather without.
Bathing men, in sea long, at Dräppe,
take only a little weak wine, & spirit.



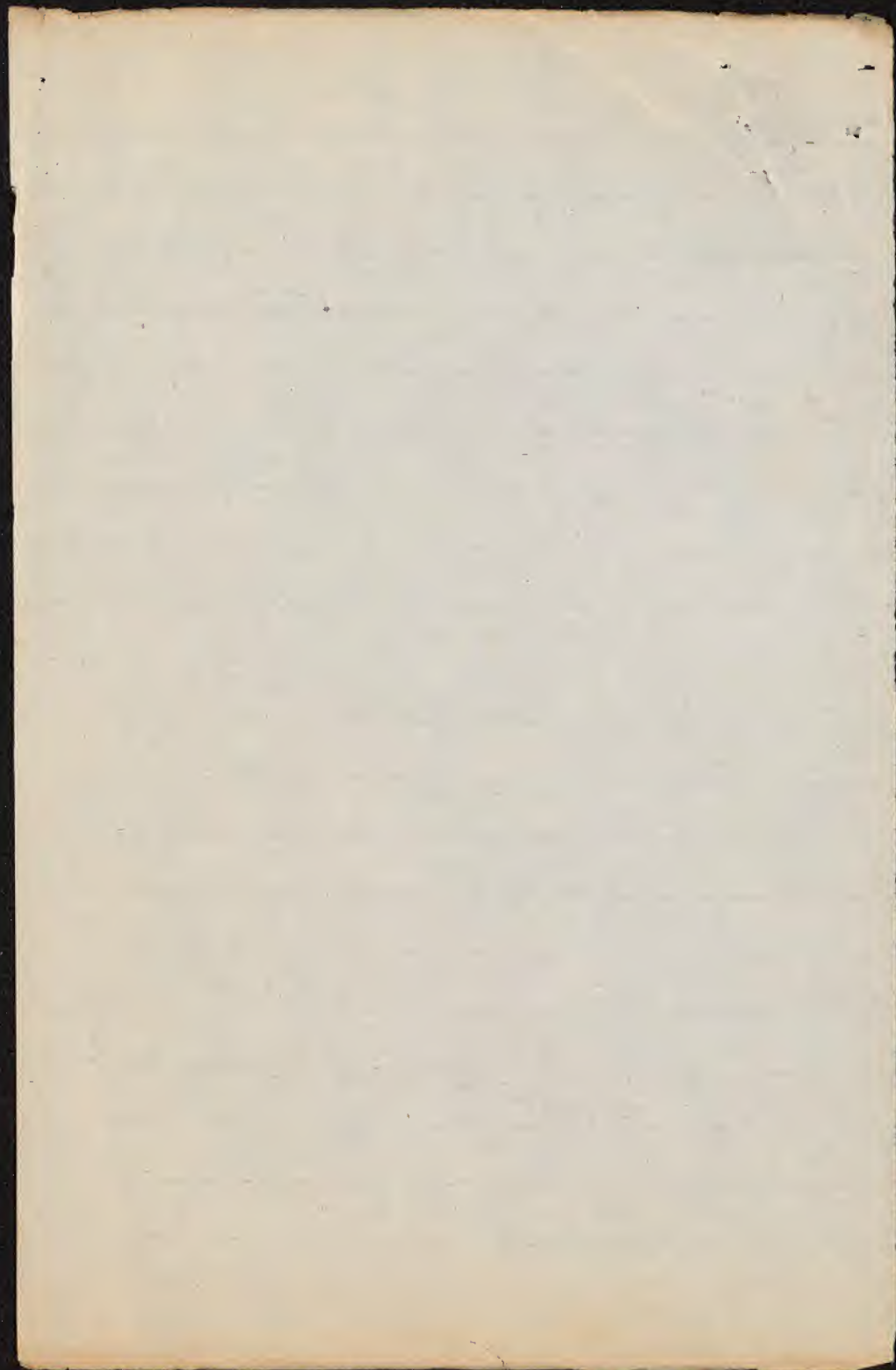


Later, in Crimean War, its
Medical Historian, Inspector General
Sir John Hall, gives a very
clear report.

An example:

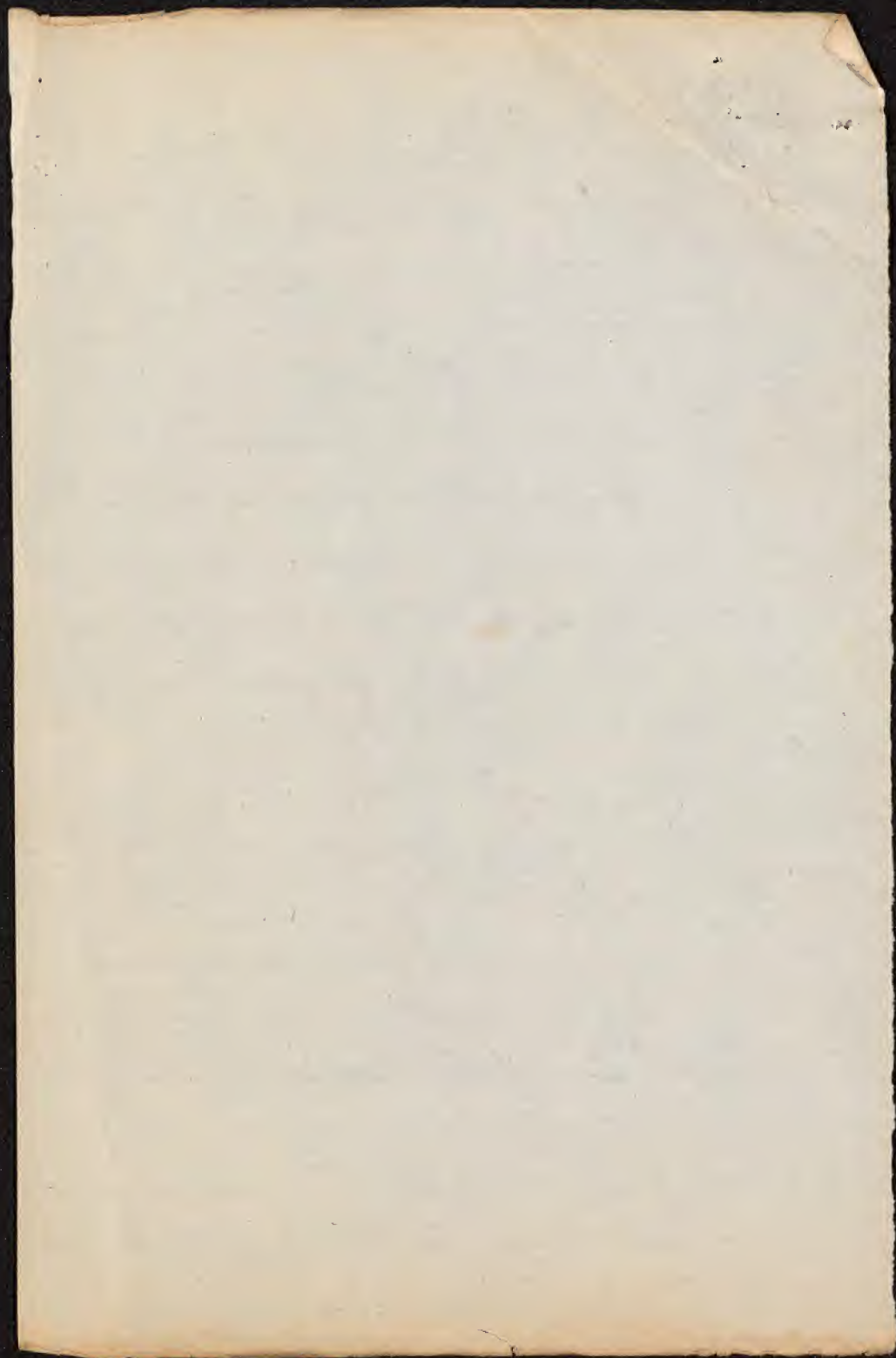
A corps of the army of the Germanic
Confederation, in 1846, had 27,859 men
under arms. of these 21,752 received
rations of spirits, 6107 none; the
former had 2.17 per cent sick, -
the latter 1.27 per cent.

3. Malaria. Statements are made
on both sides. Our great American
author upon malaria, late & Drake
of Ohio, - gave strong facts to show
that abstinence gives the best chance
of escaping malaria.



As to Yellow fever, it
is a general medical opinion
in N. Orleans & elsewhere South
that the most numerous victims
of that disease are Drunken
men.

Cholera is not, perhaps,
more likely, but certainly is not
less so, to attack the spirit-
drinker; but, when attacked, death
in him is much more probable
than in another.
In the U. S. navy, if not in the army, about which I
am not certain, the spirit-rations have been abolished.
In reference to the use of
spirits in the army, Dr. Parke
observes: —



"If spirits neither give strength to the body, nor sustain it against disease — are not protective against cold and wet, and aggravate rather than mitigate the effects of heat — if their use even in moderation increases crime, injures discipline, and impairs hope and cheerfulness, — if the severest trials of war have been not merely borne, but most easily borne without them, if there is no evidence that they are protective against malaria or other diseases, — then I conceive the medical officer will not be justified in sanctioning their issue under any circumstances."

For medicinal use, spirits, as whiskey or brandy, — should be given in tablespoonful or, sometimes, even, teaspoonful doses. I have known many cases, especially with female patients, in which a teaspoonful has done good, when a tablespoonful would evidently do harm.



Read



& then began p. 239, made.

DISINFECTION BY MEANS OF AROMATIC AND OTHER OILS.

DR. JOHN DAY, of Geelong, Australia, in a letter to Mr. E. Rimmel, the well-known perfumer, which we find in the *London Chemist and Druggist*, has some interesting remarks on this subject, from which we cull the following paragraphs:—

I have, I believe, succeeded in proving, on different occasions, in papers read before the Medical Society of Victoria, that not only *all* essential oils, but also *all* expressed oils, possess the property of acting on the oxygen of the atmosphere, and converting it into peroxide of hydrogen, a substance which is now recognized as one of Nature's most powerful disinfectants. In the form of spray, perfumes absorb and chemically change the atmospheric oxygen very rapidly. . . .

I have found that by brushing over thin note-paper, such as I am writing on, with gasoline, it is at once converted into a disinfectant, and will retain that property for many months. Letters might be written on such paper in a small-pox hospital, without, I am satisfied, the slightest danger of their conveying the infection.

I will tell you an easy and certain way of testing the presence of peroxide of hydrogen in essential oils or other substances. Peroxide of hydrogen *alone* is incapable of oxidizing and turning blue the resin of guaiacum; but in the presence of blood, particularly when it is diluted with water, it does so readily. You must use for this purpose a solution of the guaiacum resin in alcohol—not the tincture of the British Pharmacopœia, which contains ammonia, and would spoil the experiment. You might get a little sheep's blood, and dilute it with water. Put a drop or two on a piece of white blotting-paper, then pour over it a little of your old Eau de Cologne or lavender water, and, lastly, a few drops of tincture of guaiacum, when, if peroxide of hydrogen be present, a beautiful blue reaction will be the result. This is an infallible test for peroxide of hydrogen.

SANITARY AND MEDICAL MEMORANDA.

ARSENIC IN WALL-PAPERS.—Notwithstanding all the warnings against the use of poisonous paper-hangings, they are still made and used to an enormous extent. The remedy rests of course with those who buy and use them. So long as the goods find a market they will be manufactured. A chemist in Birmingham, Eng., writes to the *Post* of that city that he had been led by the illness of his children to examine the paper on the walls of a room used as a school-room in his house, and found that it contained an excessive quantity of arsenic. On seeking a paper of moderate price to replace the poisonous one, he found it difficult to get one wholly free from arsenic. "The arsenic," he says, "is by no means confined to the green colors; those with a bright glaze seem to be especially bad, and almost all the cheaper papers have more or less of this." He suggests that it would be a good idea for some manufacturer to make and guarantee papers free from arsenic. The matter must be "kept before the people" until it becomes the interest of makers to do this.

CARBOLIC ACID IN PHTHISIS.—The *London Lancet* says: "Dr. Berkart requests us to state that he lately injected weak solutions of carbolie acid through the thoracic parietes into the lung in a very bad case of phthisis at the Tottenham Hospital. The effect produced was most striking. In a few minutes after the operation, which is said to be quite painless, the patient was 'sitting up in bed comfortably, eating an egg.' In Germany, Koch and Mosler have recently published observations on this subject, but Dr. Berkart informs us that he had suggested the idea as far back as 1872."

recommends that the head should be bent forward on the introduction of the tube, instead of backward, as is generally taught in books. When the head is thrown backward, he says, the spine becomes convex anteriorly, and as the tube is passed along it has a tendency to impinge upon the larynx; but when the head is bent forward, the mouth, pharynx, and œsophagus form a curve along which the tube glides gently into the œsophagus, and at the same time is directed away from the larynx.

WET COAL.—The *London Medical Record* says that people who store wet coal in their cellars are laying up for themselves a store of sore throats and other evils consequent. Even the fire-damp which escapes from coal mines arises from the slow decomposition of coal at temperatures little above that of the atmosphere, but under augmented pressure. By wetting a mass of freshly-broken coal and putting it into a warm cellar, the mass is heated to such a degree that carburetted and sulphuretted hydrogen are given off for long periods of time, and pervade the whole house. The liability of wet coal to mischievous results under such circumstances may be appreciated from the circumstance that there are several instances on record of the spontaneous combustion of wet coal when stowed into the bunkers or holds of vessels. And from this cause, doubtless, many missing coal-vessels have perished.

The writer of course refers to bituminous coal, though the same is true, to a limited extent, of anthracite.

STATIC ELECTRICITY AS A THERAPEUTICAL AGENT.—Although frictional or static electricity in a primitive form was employed fifty years ago in the treatment of disease, it has been quite superseded in our day by galvanic or dynamic electricity. Dr. Arthius, of Paris, has recently devised new methods for the application of static electricity, and claims that as a therapeutical agent it has many advantages over the other form of the force. He has published a little book on the "Treatment of Nervous and Rheumatic Affections by Static Electricity," in which he describes his apparatus and process, with an account of cases in which cures have been effected by their use. This work has been translated by Pro

bearing fatigue, even when given in a quantity which many spirit-drinkers would deem within the limits of moderation, lessens muscular force; and a quantity in excess of this, it was shown, entirely destroyed the power of work. The reason, Dr. Parkes says, was twofold. There was, in the first place, *narcosis* and blunting of the nervous system—the will did not properly send its commands to the muscles, and the muscles did not respond to the will; and secondly, the action of the heart was too much increased, and induced palpitation and breathlessness which put a stop to labor. The inference was, ‘that even any amount of alcohol, although it did not produce symptoms of narcosis, would act injuriously by increasing unnecessarily the action of the heart, which the labor alone had sufficiently augmented.’ For fatigue, rest and food are the proper remedies. Alcohol given alone under such circumstances can only stimulate the already nearly exhausted heart to fresh exertion. Under some very exceptional circumstances it may be a matter of absolute necessity to do this; but even then we must follow Dr. Parkes’s rule—namely, to give spirits in small quantity, not more than an ounce of brandy; and if possible it should be mixed with Liebig’s meat-extract, which has a great power of removing the sense of fatigue. Dr. Parkes even gives a formula, which is worth bearing in mind, for use under such circumstances; as, for example, when troops, after a fatiguing march, are obliged to engage the enemy without time for rest and food, he advises two ounces of red claret wine, with two teaspoonfuls of Liebig’s extract, in half a pint of water. Wine not being available, half an ounce of brandy or rum would be a good substitute.

“It is almost superfluous to add, that the best substitute for alcohol is coffee or tea. The French military medical officers vaunt, and with justice, the superiority of the light wines of their own country over the more strongly brandied wines of Spain and Portugal; and they point to the fact that, when used in moderation, the aromatic principles and the various salts they contain exercise an effect on the digestive organs which is alike wholesome and agreeable. With all this, the best of them give a decided preference to coffee. Morache, in particular, is emphatic in his testimony, and is even eloquent in its praise as an article of diet, a safe stimulant, an aid to digestion, and an efficient refreshment under fatigue. Coffee forms no part of the ration of the French soldier in time of peace; but Morache does not hesitate to urge its issue instead of brandy, and he instances certain regiments in which the custom of substituting coffee for the morning *petit verre* had much advanced the cause of temperance.

“That a cup of hot coffee is the best preparation for the fatigues of a march is indisputable, and it should never be omitted.—It is much better that the men should have it before leaving their ground, and not at the half-way halt, as was common in my time in India: it invigorates them at starting, protects, particularly the young soldiers, against the griping abdominal pains to which they are subject, particularly in the dark and chilly hour preceding the dawn; and the vigor it imparts helps the system to resist the miasm which at this hour is most freely evolved from the soil. It is worthy of remark that coffee was first issued to European troops for this very purpose, on the advice of the great Larrey, during Napoleon’s Egyptian campaign.”

Professor Maclean mentioned an instructive example of the mischief of spirit-rations served out in hot climates. The troops holding Canton were called on to turn out at midday. A battery of artillery had more cases of insolation than all the rest of the force put together, the reason being, that the canteen was opened by the officer commanding with the “good intention” of “fortifying” his men with a glass of grog before starting.

SPIRIT-RATIONS FOR SOLDIERS.

WE find in a recent number of the *London Medical Record* a full report of a lecture at the United Service Association by Surgeon-General Maclean, in which he strongly condemns the spirit-ration of the British army, especially in hot climates. We commend the following passages from the lecture to those who still cling to the old notion that the use of spirituous liquors assists a man to bear exposure or fatigue:—

“If there be any point of military hygiene that may now be regarded as settled beyond doubt or cavil, it is this, that spirits are not only not helpful, but are hurtful to the marching soldier, everywhere, I believe, but nowhere more so than in hot climates. The evidence on this point is overwhelming. The medical officers of the French army, who have had great experience in the arduous campaigns in Algeria, denounce the spirit-ration as hurtful; and Dr. Morache, already quoted as a high authority on military hygiene, declares that, unless coffee had taken the place of spirits, it would have been impossible for the troops to surmount the fatigues of what he justly calls *ces pénibles campagnes*. Were I the medical chief of an army destined to take the field in a tropical climate, not a drop of spirits should, with my consent, accompany it, save what the requirements of the ambulance service demanded. The evidence shows that wherever soldiers, by accident or design, have been cut off from the use of spirits on marches, on active service, in temperate climates exposed to wet and cold, or in the tropics to ardent heat, or in laborious sieges, they have maintained their health, spirits, and discipline far better than when the once-deemed indispensable grog was in daily use. My colleague, Dr. Parkes, and the late Count Wollowicz, in a series of careful experiments on the use of alcohol carried on at Netley, and published in the ‘Transactions of the Royal Society,’ have placed on a sure scientific basis what was before a matter of observation, and have established that alcohol, far from increasing the power of

Extract of a letter from Dr. Parkes, of Netley Hospital, who said, "As a matter of individual opinion, were I going on the Arctic Expedition, I should, on the faith of the evidence before me, entirely abstain from alcohol; but, at the same time, I should be extremely interested to see all round how the question worked. If there are any men going in the expedition who take a large quantity, only one result can be anticipated, viz., that they will break down; but the question is, how will it fare with some of those who take only a small quantity."

alone." A revived ~~meeting~~ ^{prayer-meeting} ~~was~~ ^{is} so
it was in the days of Wesley and Whitefield, and so it should
be now. If Christians would praise God continually, and,
like the psalmist, 'sing aloud on their bed,' London would
be awakened pretty quick. We want to fill London with a
new song, and send the music of it into the dark alleys and
lanes, and into the homes of the people. If we praise God
here, then, like the psalmist, we can lay down our harp and
go up on high where we would get a better one.

Mr. Sankey contrasted the present meeting with the first
prayer-meeting they held at York shortly after they landed

THE following facts in regard to temperance and intemperance are the recorded results of the examinations of insurance companies, but they will serve also as a brief and effective temperance lecture:

In a given number of risks, 10 temperate persons die, between the age of 15 and 20, inclusive, and 18 intemperate. In a given number of risks, 10 temperate persons die, between 21 and 30, and 51 intemperate—the risk being on an inebriate more than 500 per cent. greater than on a temperate person. So 10 temperate persons die, between 31 and 40, inclusive, and about 40 intemperate, or the risk is increased some 400 per cent. Hence insurance companies avoid risks on inebriates, as they would on consumptives or those suffering from Bright's disease, etc. A temperate person's chance of living is at 20, 44.2 years; at 30, 36.5 years; at 40, 28.8 years. An intemperate person's chance of living is at 20, 15.6 years; at 30, 13.8 years; at 40, 11.6 years. Deaths from inebriety are not reported on account of the opprobrium which attaches to deaths from that disease. The certificates of deaths from diseases of the brain, liver, and kidneys, organs specifically affected by alcohol, are as follows: Diseases of brain, 689; liver, 118; kidneys, 562—making in all 1,369. The Registrar states it as his opinion that at least 20 per cent., or 273 of these cases, were the immediate result of intemperance. This number, added to the number of those reported as dying from delirium tremens, gives 551 deaths from alcohol, or one to 1,815 inhabitants.

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Statistics of Intoxication.—Every nation, remarks a French medical writer, seems to have its peculiar intoxicating drug. Siberia has its fungus; Turkey, India, and China, have their opium; Persia, India, Turkey and Africa, from Morocco, down to the Cape of Good Hope, and even the Indians of Brazil, have their hemp and hachish; India, China, and the Eastern Archipelago, have their beetle and beetle-pepper. The islands of the Pacific have their daily hawa. Peru and Bolivia their eternal coca; New Grenada and the chains of the Himalaya their red thorny apple; Asia, America, and the whole world, perhaps, patronize tobacco; the English and Germans have hops, and the French have lettuce. Of all these drugs, tobacco is that which claims sovereignty over the largest portion of the human race, for its votaries are stated at 200,000,000; opium, fortunately, does not boast more than 400,000,000; but hachish, a drug quite as intoxicating as opium, is commonly indulged in by 300,000,000 of people. Betel, which in point of fact, is hardly more than a gentle stimulant, extends its sway over about 100,000,000. Coca, the virtues of which have scarcely been studied, except by Professor Mantegazza, of Milan, can barely muster 10,000,000 of people; and all the other drugs taken together, including the *Hlex Vomitoria*, of Florida, are used by about 25,000,000 of the human race.

Don't cough!

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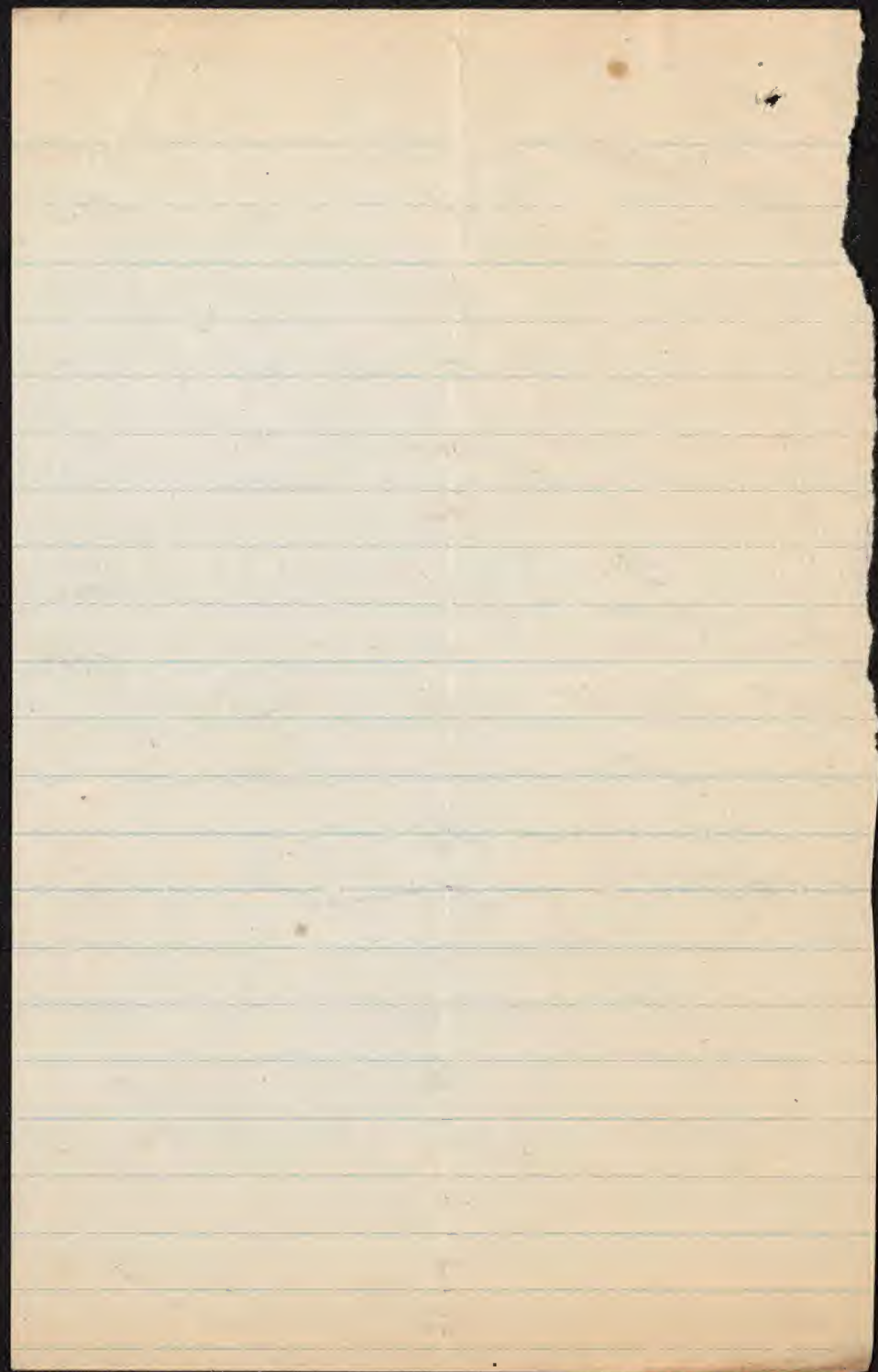
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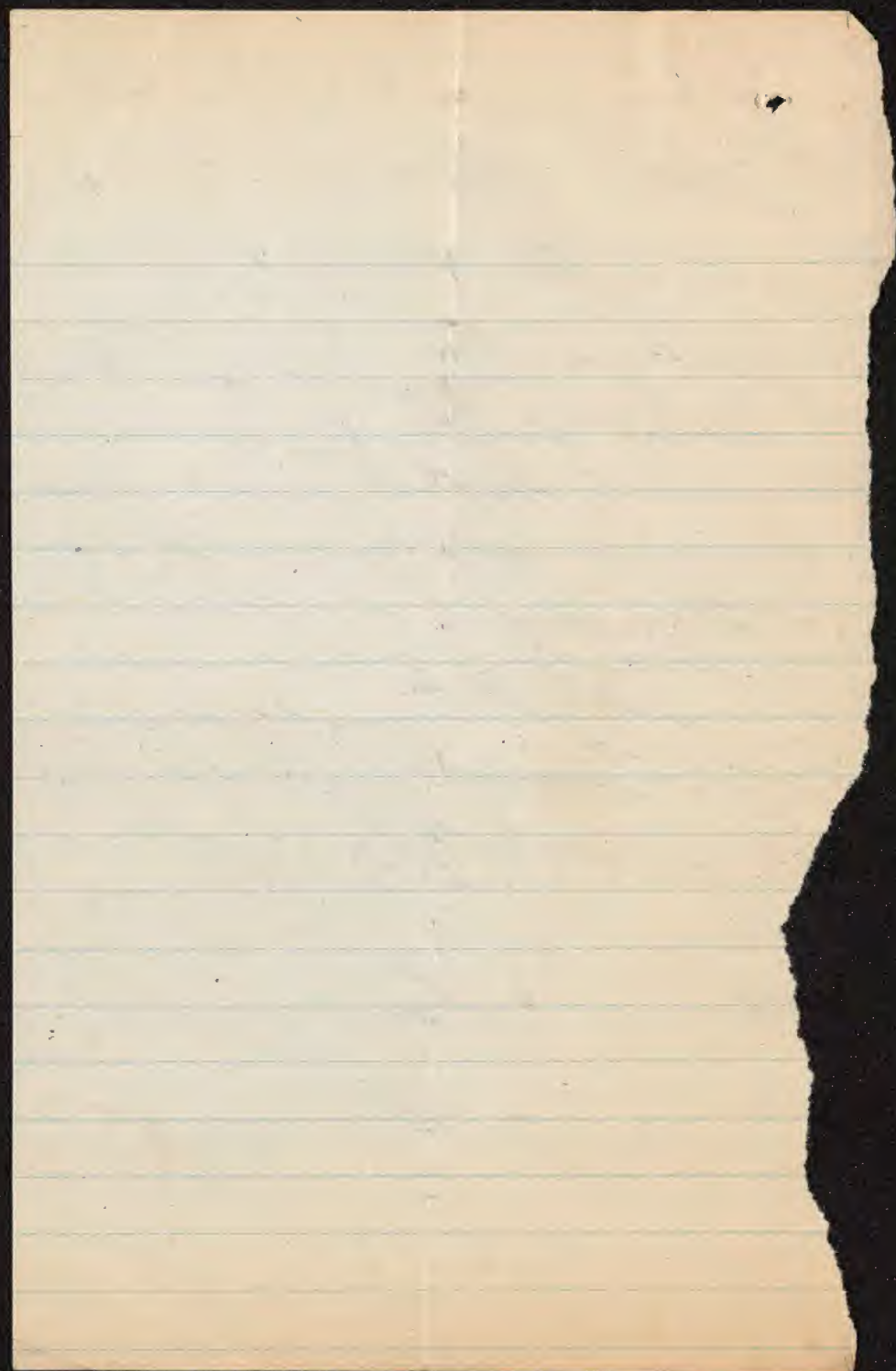
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Medical Declaration of British
Physicians, 1871.

As it is believed that the inconsiderate prescription of large quantities of alcoholic liquid by medical men for their patients has given rise, in many instances, to the formation of intemperate habits, the undersigned, while unable to abandon the use of alcohol in the treatment of certain cases of disease, are yet of opinion that no medical practitioner should prescribe it without a sense of grave responsibility. They believe that alcohol in whatever form should be prescribed with as much care as any powerful drug, and that the directions for its use should be so framed as not to be interpreted as a sanction for excess or necessarily for the continuance of its use when the occasion is past. They



are also of opinion that 2
many people immensely exaggerate
the value of alcohol as an article
of diet, and since no class of men
see ^{so} much of its ill effects, and
possess such power to restrain its
abuse, as members of their own pro-
fession, they hold that every medical
practitioner is bound to exert his utmost
influence to inculcate habits of great
moderation in the use of alcoholic li-
quors. Being also firmly convinced
that the great amount of drinking
of alcoholic liquors among the working
classes of this country is one of the
greatest evils of the day, destroying —
more than anything else — the health,
happiness & welfare of those classes,
and neutralizing, to a large extent,
the great industrial prosperity which



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Providence has placed within
the reach of this nation, the under-
signed would gladly support any
wise legislation which would tend
to restrict within proper limits
the use of alcoholic beverages,
and gradually introduce habits
of temperance."

Signed by Geo. Burrows, M.D.,
A.R.S., Pres. of Royal Coll. of Phys.;
Geo. Busk, A.R.S., Pres. of Royal
Coll. of Surgeons; & 300 leading
physicians of London, in all.

— See Report of Am. Associn. of Sup'ts
of Insane Asylums for 1872; pub. 1873.

Note

Sir Henry Thompson's
published testimony as to the very
considerable amount of disease
coming under his observation
from moderate drinking.

tinue to call the poisonous principles of tobacco, can enter the body through various channels—by the stomach, by the lungs, by subcutaneous injection, and by the skin itself. But, in whatever manner it enters the human system, its effects are, in the main, uniform.

The most immediately noticeable symptom following smoking is the undue acceleration of the laboring forces of the heart. Under the stimulus of tobacco the heart beats more quickly, as is evidenced by the rising pulse. We have not the mass of detailed evidence as to this fact which exists in relation to alcohol, but the experiments made by Dr. Edward Smith, and related to the British Association in 1864, are full of interest. "The experiments were made at 10 P. M., when the rate of pulsation naturally declines (as he had proved by hourly experiments published in his work on the 'Cyclical Changes of the Human System,') and at least four hours after any fluid or solid food had been taken. They were made in the sitting posture, after it had been maintained fifteen minutes, and with the most absolute quietude of body and mind; and thus all influences were eliminated but those due to the tobacco. The rate of the pulsation was taken every minute for a period beginning two or three minutes before the smoking began, and continued during twenty minutes, or until the pipe was exhausted.

The following are the chief results obtained:

EXPERIMENT 1.

Pulsation before smoking was $74\frac{1}{2}$ per minute.

Smoking 6 minutes—79, 77, 80, 78, 78, 77 per minute = 78.1 average.

Smoking 7 minutes—83, 87, 88, 94, 98, 102, 102 per minute = 93.4 average.

Smoking 8 minutes—105, 105, 104, 105, 105, 107, 107, 110 per minute = 106 average.

After smoking 11 minutes—112, 108, 107, 101, 101, 100, 100, 100, 100, 98, and 91.

There was thus a maximum increase of $37\frac{1}{2}$ pulsations per minute.

EXPERIMENT 2.

(Smoking through camphor julep in a hoo-kah.

Pulsation before smoking, $79\frac{1}{2}$ per minute.

Smoking 6 minutes—81, 81, 81, 83, 82, 82 per minute = 81.6 average.

Smoking 17 minutes—85, 89, 89, 93, 96, 90, 94, 94, 93, 92, 95, 95, 95, 96, 94, 97, 93 = 93.

The maximum increase was $17\frac{1}{2}$ pulsations per minute.

EXPERIMENT 3.

(Smoking an empty pipe.)

Pulsation before smoking, 78 per minute.

Smoking 11 minutes—76, 78, 77, 76, 79, 79, 80, 80, 79, 78, and 79.

There was no increase in the rate of pulsations from the effort of smoking, or from its interference with the respiration.

EXPERIMENT 4.

(To ascertain if, after smoking 6 minutes, during which the effect is very small, and then ceasing smoking, any increase in the effect would follow.)

Pulsation before smoking, 75 pulsations per minute.

Smoking 6 minutes—76, 75, 79, 79, 76, 78.

Smoking 1 minute—82. Cease smoking.

Smoking 10 minutes—81, 88, 83, 82, 84, 83, 83, 80, 82.

The rate of pulsations was maintained, but was not materially increased.

EXPERIMENT 5.

(To prove if the rapidity of smoking causes a variation in increase of pulsation.)

a. Greater volume of smoke.

Pulsation before smoking, $70\frac{1}{2}$ per minute.

Smoking 6 minutes—68, 70, 71, 70, 72, 74 = 70.8 average.

Smoking 6 minutes—76, 77, 86, 89, 91, 94 = 85.5 average.

Smoking 4 minutes—98, 95, 96, 95 = 96.0 average.

The maximum effect was thus $27\frac{1}{2}$ pulsations per minute.

b. Smoking faster.

Pulsation of the last minute in the previous part of this experiment, viz., 95 per minute—smoking 3 minutes, 94, 94, 96.

c. The pipe recharged.

Smoking 5 minutes—87, 93, 96, 96, 96.

There was, therefore, a large effect upon the pulsation, but probably not more than would have occurred with ordinary smoking.

Numerous other experiments were made with tobaccos of different reputed strengths and upon different persons, and the author gave minute directions as to the proper method of making such inquiries."

* The heart, then, during the act of smoking, was doing extra work; in some of the experiments this additional labor amounting to more than 50 per cent.

The effect upon the heart is not caused by direct action upon that organ, but by paralyzing the minute vessels which form the batteries of the nervous system. Thus paralyzed, they can no longer offer effectual resistance, and the heart, freed from their control, increases the rapidity of its strokes, expanding the vessels, with an apparent accession, but real waste of force.

Its effect in lowering the animal temperature is very striking. When the walls of the blood-vessels are distended with that fluid, the increase in volume decreases the rapidity

of the circulation and augments the local warmth. When the walls partially collapse, the circulation becomes quicker, but the heat diminishes. The heat, in fact, is transformed into motion.

(To be continued.)

DR. NEWMAN'S "CHRISTIANITY AS A SYSTEM."

A correspondent of the *London Friend* cites this striking testimony from a distinguished clergyman, who left the Church of England for that of Rome, to the fact that there is no warrant in Holy Scripture for ceremonial observances and "sacraments" in the church of Christ.

The writer of a review (in the *Spectator*, August, 1872,) of this work, quotes the following passages from it, not in the author's order, but re arranged :

"There is not a single text in the Bible enjoining Infant Baptism." "There is no text in the New Testament which enjoins us to establish religion." "The words in which the Eucharist is spoken of by St. Luke and St. Paul in no respect introduce that meaning which the church has put on them." "There are texts in the New Testament actually inconsistent with the church system of teaching. What can be stronger against the sanctity of particular places, nay, of any institution, persons, or rites at all, than our Lord's declaration, That God is a Spirit, and that they who worship Him must worship Him in Spirit and in Truth?" "Or against the Eucharistic sacrifice, than the contrast in Hebrew x. between the Jewish sacrifices and the one Christian atonement? or can baptism really have the gifts which are attributed to it in the Catholic or Church system, considering that St. Paul says that all rites are done away with, and faith is all in all? The tone of the New Testament is unsacramental, and the impression it leaves in the mind is not that of a priesthood and its attendant system." Dr. Newman gives this statement of what his opponent may allege. Dr. Newman cannot rely on tradition to refute his opponent, inasmuch as one finds no mention in the apostolic fathers of Baptism or the Lord's Supper, except in a doubtful sentence on Baptism in Barnabas's letters, of which the Sinaitic MS. omits the pith, and in those epistles of Ignatius which are not accepted as genuine.

C. F.

10th mo. 24th, 1872.

THE MANGROVE.—There is a special provision made by nature for the mangrove. The seed drops at the proper season, and is in

danger of being carried away by the stream from the muddy bank on which alone it could grow; but it is possessed of a small rootlet, by which it can attach itself at once to the swampy ground, and remain there at security. These rootlets are put forth, and the stem gradually rises up from the midst, and thus another mangrove is added to the great belt of trees that lines the bank.—*Journal of Chemistry*.

IMPORTANT METEOROLOGICAL DISCOVERY.

The researches of the signal office have just been rewarded by a beautiful and highly important meteorological discovery. On the coast of England from time immemorial, the phenomenon of the great November atmospheric wave has been the speculation of scientists and seamen, but Sir John Herschel and others have supposed it was peculiar and confined to England and West Europe, which it reaches from the South Atlantic, and over which it rolls in long continued undulations from October till January, constituting an important element in the phenomenal character of European winter.

On the 12th of November a similar atmospheric wave began to break over the shores of Oregon and British Columbia, as shown by the weather telegram. By the evening of the 13th inst., it had spread over nearly all the Pacific States and Territories, Utah and Nevada, and at midnight was pouring through the passes of the Rocky Mountains. On Thursday, the 14th, it descended upon Colorado, Nebraska, Kansas and Indian Territory. On Friday morning it extended in apparently unbroken magnitude and magnificence from Oregon and Washington Territory eastward, through the great trough or depression of the Rocky Mountains, and stretched thence to the lower Missouri and lower Mississippi valleys, and over the western shores of the Mexican Gulf. This discovery will enable meteorologists to anticipate by many days the approach of winter, as it advances from the Pacific coast eastward, in the great current of westerly winds.

It seems to clear up the old mystery of American winter storms, showing that they originate in the Rocky Mountains, upon whose cold and loftiest summits in Nevada, Utah, Colorado and Southern Wyoming, the vapor-laden air of this wave coming over the warm Pacific, is now seen to be condensed in the overwhelming snows of the forty-first parallel. As this vast aerial wave is probably, like the English wave, continued in successive undulations for two or three months, it may assist in explaining the comparatively high temperature and light precipitation in winter along Puget's Sound and eastward.

NO. 583.

TOBACCO AND ITS EFFECTS.

A Prize Essay

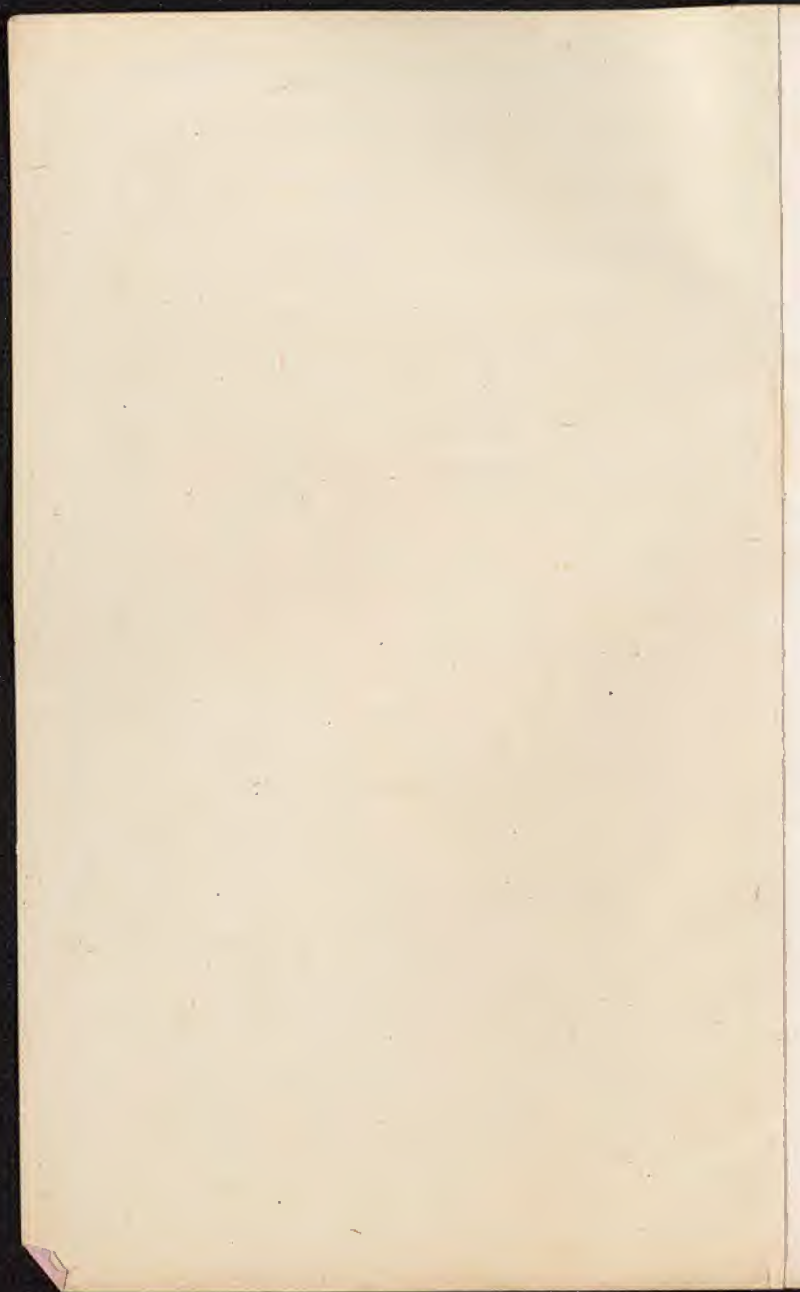
SHOWING THAT THE USE OF TOBACCO IS A PHYSICAL, MENTAL, MORAL, AND SOCIAL EVIL.

BY HENRY GIBBONS, M.D.,

OF SAN FRANCISCO, CAL.,

PROFESSOR OF MATERIA MEDICA IN TOLAND MEDICAL COLLEGE, AND EDITOR OF
THE PACIFIC MEDICAL AND SURGICAL JOURNAL.

"Obsta Principiis."



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NEW YORK:

CARLTON & LANAHAN.

CINCINNATI: HITCHCOCK & WALDEN.

TRACT DEPARTMENT.

NOTE BY THE EDITOR.

SOME months since the Board of Managers of the Tract Society of the Methodist Episcopal Church offered a prize of \$250 for the best approved Essay on the Evils resulting from the use of Tobacco. About fifty MSS. were sent in and submitted for examination to a committee consisting of E. G. ANDREWS, D.D., S. A. PURDY, M.D., and W. H. DIKEMAN, Esq. This very able committee unanimously adjudged the prize to the author of this Essay. The reader will find the argument against Tobacco clearly, guardedly, and conclusively put. We commend it to the candid consideration of all men, especially to those who have offered their souls and *bodies* as a living sacrifice to God.

D. WISE.

PREFATORY NOTE.

IN preparing these pages care has been taken to avoid all statements in regard to the injurious effects of Tobacco, which cannot be sustained by good medical authority. It has not been deemed necessary to encumber the text with references, though in a few instances the names of authors are given. The writer has dealt with the subject in all good conscience, and in accordance with his own honest convictions. The limit prescribed for the Essay has required a degree of brevity in some parts, perhaps, not entirely comporting with the most impressive forms of speech.

The subject has been considered under seven heads, namely:

I. ITS NATURE AND PROPERTIES.

II. EFFECTS ON THE BODY.

III. EFFECTS ON THE MIND.

IV. MORAL EFFECTS.

V. SOCIAL EFFECTS.

VI. WHAT GOOD DOES IT DO?

VII. CONCLUSION.

TOBACCO AND ITS EFFECTS.

I. ITS NATURE AND PROPERTIES.

MEDICAL writers, without exception, describe tobacco as a *poison*. It owes its poisonous nature to a substance called NICOTIA, which is extracted from it, in the form of a liquid, by chemical processes. Nicotia is capable of producing death sooner than any other poison except prussic acid [stillé]. The time required to accomplish this result is from two to five minutes. One drop of it killed a rabbit in three minutes and a half. The thirty-second part of a grain produced, in several individuals who tried the experiment, burning of the mouth, throat, and stomach. In two persons the sixteenth of a grain brought on spasms; and the effects were felt for three days.

Dogs to whom tobacco is freely administered die in spasms, and their blood is found after death not to be coagulated. The same condition of blood exists after death from most other poisons, and from lightning. On the other hand, healthy blood always coagulates on cooling.

When tobacco is taken into the mouth the nicotia is absorbed by the lining membrane, and carried into the blood. There it circulates throughout the body, and comes in direct contact with the brain and every other organ. In this way it produces in persons not accustomed to it, nausea, vomiting, prostration, and faintness.

When tobacco is smoked in the cigar or pipe, the poisonous principle enters the smoke, and is carried into the blood in the same manner by being absorbed in the mouth and lungs. Birds and frogs confined in tobacco smoke are killed by it. Every person who respires the smoke of a cigar or pipe, willingly or unwillingly, must have the blood in his veins more or less impregnated with the poison nicotia.

Tobacco is absorbed in like manner by the skin. If a cigar be unrolled and moistened, and then applied over the stomach of a child, it will soon bring on sickness and vomiting, and may endanger life. Children have been killed by its application to the head in diseases of the scalp, and also by injecting the infusion into the bowels. Soldiers have been known to apply it in their arm-pit so as to cause sickness, that they might escape from duty. In short, tobacco in all forms is regarded by physicians as too dangerous for common use as a medicine; and it is employed only in lock-jaw, and a few other extreme disorders.

II. EFFECTS ON THE BODY.

The mouth and throat are injured more by smoking than by chewing, because the smoke conveys the noxious principle in a more concentrated form to the delicate lining. Pipes are sometimes made with small reservoirs under the bowl, in which some of the poisonous vapor is condensed, to be emptied out by unscrewing the lid of the reservoir. The oil thus condensed is a violent poison. One or two drops taken into the stomach might produce dangerous consequences, and even death. In using the cigar, and the pipe without a reservoir, it is drawn into the mouth.

The reader will now comprehend without difficulty why much smoking causes redness and dryness of the lining of the mouth, tongue, and throat, accompanied with thirst. Some medical writers recognize what they call the "*Smoker's Sore Throat*," resulting from this cause. Sometimes a small blister appears in the mouth, which by the continued irritation of the acrid matter becomes an ulcer, and finally assumes a cancerous character. Cancer of the lip has been observed in Europe as a frequent occurrence, produced by the pressure and heat of the pipe or cigar, in connection with the irritation of the acrid oil. Besides, it is supposed that syphilis has been communicated by the pipe of an infected person.

The voice is often affected by the free use of tobacco, especially by snuffing and smoking, through which the poison is brought into direct contact with the organs of the voice and the surrounding parts.

The stomach and digestive organs cannot fail to be disordered by it. Let us consider that the saliva is not a simple fluid, the place of which can be supplied by water, but a chemical secretion designed by the Creator to pass into the stomach and aid in the process of digestion. Supposing a chewer or smoker to spit a table-spoonful every ten minutes, which, to judge from the appearance of the floors of churches and lecture rooms on certain occasions is not an extravagant estimate, we should have a pint or more of salivary fluid drained away in a very short time. It might be a useful question for all persons who use tobacco to address to their own reason: Is it possible so to violate the laws of nature without injury, and serious injury too, sooner or later? What wonder that we behold on our public thoroughfares so many youths, who, rolling the perpetual quid back and forth from cheek to cheek, or drawing incessantly at cigar or pipe, display the sharp and fleshless jaw, and the sallow and cadaverous countenance?

It is not uncommon for persons who have become addicted to the excessive use of tobacco, and who abandon the habit, to grow fat rapidly. The production of fat is sometimes so great as to induce them to resume its

use in self-defense. There is an old story of a man who, seeing a bear descending tail foremost from a tree, seized him as a valuable prize. But finding that he could not manage the beast he determined to let it go. Immediately, however, the bear clutched the man in his powerful arms, and became master of the situation. So it is with our bad habits. We begin by adopting them for our pleasure or service. They clutch us before we know it, and we end by becoming their abject and helpless victims. "*Obsta principiis*," says the ancient maxim: *oppose beginnings*. "Do not attack the bear." This is the only true philosophy. Avoid the first step. Do not take the first chew. Do not smoke the first cigar.

Though the waste of saliva is a violation of natural laws, the swallowing of it saturated with nicotia is still worse. There is no escape from the dilemma.

All writers are agreed in placing among the common effects of the free use of tobacco debility and loss of tone of the stomach, nausea, failure of appetite, indigestion, and constipation of the bowels. The liver also is liable to suffer. We have known sick headache and bilious vomiting to arise from this cause, and to recur periodically until they entirely disappeared with the disuse of tobacco.

The complexion is rendered sallow, and the face and body lank and thin. Even the physiognomy is sometimes altered and the countenance distorted; the mouth

growing lopsided by carrying the quid or cigar or pipe mostly on one side. Not unfrequently a gap is made in the jaw, the teeth being destroyed by the heat and acridity of the pipe or cigar. The nose, too, is disgustingly deformed by long use as a snuff-box.

The lungs suffer in some instances, a cough being induced, attended with emaciation, resembling pulmonary consumption.

The heart comes in for a large share of mischief. Its intimate relation to the stomach and to the nervous system leads to irregular action and palpitation. Of eighty-eight inveterate smokers who were examined for the purpose, the pulse, which always shows how the heart is beating, was irregular in twenty-one.

A very common and serious disorder of this organ, brought on both by tobacco and alcoholic drinks, and more especially by the two conjointly, is known among writers as the *fatty heart*. In this condition the muscular fibers of the heart, on which depends its strength, are softened and weakened; and its walls are liable to stretch with the pressure of the blood, thus laying the foundation for what is called *aneurism*. The same diseased condition is still more common in the large arteries near the heart. Persons with fatty hearts are always liable to sudden death. Without a moment's warning the heart may burst; or it may suddenly cease to act without rupture.

Angina pectoris is a very painful and dangerous complaint, believed by some authors to depend upon fatty degeneration of the heart. It is marked by violent pain in the region of the heart, shooting into the chest, neck, and arm, with distressing faintness and prostration. Persons affected with it are apt to die suddenly, sitting in their chair, or lying in bed. In a number of instances it has entirely disappeared by abandoning tobacco. In one case, which had been cured in this way, the patient inhaled the smoke of tobacco freely in company, in the evening, without smoking, and had a return of the malady in the night.

Diseases of the heart and large arteries appear to be increasing to an alarming extent in some parts of our country, more particularly on the Pacific Coast. They are generally incurable, and necessarily fatal. It is worthy of serious inquiry how far the increase is chargeable to the effects of tobacco and alcohol, accumulating from generation to generation.

The blood exhibits the noxious influence of tobacco in the increased fluidity, or greater tendency to resist coagulation, produced by its excessive use. As already remarked, other poisons which cause speedy death disorganize the blood in a similar manner. In other words, *they kill it*; for the blood is a living fluid, composed of organized globules or corpuscles, visible with the microscope, and swimming in a serous or watery fluid. The

corpuscles differ in size and form in different animals, and are always the most important element of the blood. In a healthy condition the microscope shows a small, central depression on each corpuscle. In great smokers this depression, though visible in the morning after a night's abstinence, disappears in the course of the day.
—RICHARDSON. B. W.

Let the reader contemplate the great importance of the blood, on the perfect condition of which depend the nutrition, growth, and healthy action of every fiber of the body; and then put to his own understanding the question, whether the poison *nicotia* can mingle and circulate with it hour by hour, day by day, year by year, with impunity; and whether a change so great as to be detected by the microscope is consistent with the proper performance of its functions.

The brain and nerves, however, suffer most from tobacco. Remember, the brain is the instrument of all motion, thought, and feeling. You cannot move your finger or your tongue, you cannot see or hear or feel, you cannot think or reason, but by means of the brain. In one sense *the brain is the man*. Not only must this delicate and sensitive organ be in perfect health, but the stream of vitalizing blood which flows upon it must come pure and undefiled in order for its perfect action. But what if the blood be saturated with the subtle *nicotia* distilled from the pipe or cigar,

or absorbed from the quid by the lining membrane of the mouth? And what if the vital stream be diseased in its essential structure?

That the memory is impaired by snuffing is a fact long since acknowledged. The excessive or long-continued use of tobacco in other modes has a similar effect. The portion of the brain lying nearest to the nose and roof of the mouth is most concerned with memory and the intellectual powers in general. Common sense would teach us that the almost perpetual irritation of a poison so virulent as nicotia, on an extensive surface contiguous to the brain, cannot be endured without injury to the organ of mind.

Amaurosis is a disease of the eye, or of the nerve of vision. Of late, the attention of medical observers has been directed to it as a common effect of tobacco. It is a serious disorder, difficult of cure, and often ending in permanent blindness.

All physicians are familiar with the action of tobacco, either alone or in co-operation with other causes, in producing tremor of the hands, general distress, languor, uneasy sleep, and even hypochondriac delusions. How often do young men in the prime of life enter the doctor's office with hands trembling like those of an old drunkard, with visage lank, sallow, and melancholy, miserable victims of the insatiable appetite! "I am sick all over, and timid as a girl," was the expressive

statement of his own condition, given by a distinguished member of Congress, a slave to the habit.

Authors refer to *paralysis* as an extreme result of the action of tobacco on the brain. *Insanity* also is sometimes traced to it.

As a *prophylactic*, or a preventive of disease, tobacco is a common resort, especially during infectious or malignant epidemics. On entering a hospital or encountering pestilence men are apt to fortify themselves with a cigar. The writer had an opportunity of witnessing the efficacy of this protective agent in the Philadelphia Almshouse, during the prevalence of cholera, in 1849. A number of medical attendants who sought protection in the cigar fell victims to the disease, though it prevailed only to a moderate extent. The cigar attracted the malady. When we reflect that tobacco is a sedative, or depressant of the nervous system, what other effect could be anticipated?

This view is confirmed by an eminent English surgeon, who says: "During the prevalence of cholera I have had repeated opportunities of observing that individuals addicted to the use of tobacco, especially those who snuff it, are more disposed to attacks of that disease, and generally in its most malignant and fatal form."—LIZARS
Snuff is capable of doing more injury than might be supposed on first thought. Besides its irritating action on the nasal passages contiguous to the brain,

it works its way in considerable quantities into the stomach.

That fermented and spirituous drinks may also have been used by the individuals above referred to does not affect the argument. Alcohol finds its way into the blood through the same channels as nicotia, and defiles and poisons the vital current. It has a similar effect in depressing nervous energy and predisposing to disease. No one can doubt that the two poisons in conjunction are worse than either alone.

It is also charged with augmenting the fatality of typhoid fever. In this disease there are ulcerations in the bowels which often produce death by *perforation*, or eating through the coats of the intestine. The excessive use of tobacco is alleged on good medical authority to favor perforation.

It is not asserted that the evils enumerated always result from tobacco, even when it is freely used. We would avoid weakening the force of our argument by seeming exaggeration. In framing laws of health we have to deal with tendencies and dangers; and when we perceive positive evils to result in many cases, we must infer the tendency and the danger in all. There can be no doubt that the very acrid poison, nicotia, finds its way into the blood of all persons who use tobacco in any form or quantity. That it produces no sensible effects, is far from proving that it does no harm. The poison of

small-pox mingles with the blood and circulates with it for days before the effects are perceived and developed. The poison of hydrophobia may lie dormant and unperceived for months.

Let not the smoker or chewer flatter himself that he is sound and secure because he feels no harm. The deadliest maladies often take silent possession of the vital organs without disturbing the general health. Death steals upon us in our sleep, and touches the walls of the heart, or of an artery in the lungs or brain; the delicate membrane begins to dilate with the pressure of the flowing blood, and grows thinner and thinner for months, and even for years, giving no warning of the peril which is imminent. At last a sudden effort, or change of posture, or the distention of the stomach by an ample meal, or a gust of passion, causes the blood to break through the attenuated wall, and in an instant all is over!

There remains to be noticed a consideration which we are inclined to regard as the most important of all. Writers who have investigated the subject are generally agreed that tobacco diminishes virility. There can be no doubt that such is its action on persons who commence the use of it in early life. We hold this to be a conclusive demonstration of the general rule, that the influence of tobacco on the human constitution is hurtful.

The subject is one of some delicacy, but its magnitude requires that it be fully and fairly examined. The laws of physical inheritance are well known; and it is fair to conclude that an agent which enervates the procreative power must exert a deleterious influence on the progeny. Thus in each successive generation the evil is aggravated. In this point of view the tobacco question identifies itself with national character and national degeneracy.

Of all civilized nations the Spaniards took the lead in the common use of tobacco. They and their American descendants are the only people among whom both sexes indulge indiscriminately in smoking. Spain has been described as one vast tobacco shop. And see how the noble old Castilian has degenerated! How are his intellectual and moral energies abased! The Turks also are great smokers; and the descendants of the warlike Saracens have become indolent and lazy and worthless. That other causes have contributed to the mischief does not turn away the point of the argument. The French savans have been much exercised of late to account for the progressive diminution in the ratio of increase of population, and the diminishing stature of the inhabitants of France. Some of them do not hesitate to ascribe it in great part to the use of tobacco and alcohol. The English people also are waking to the subject, though northern nations appear better fitted to resist the noxious tendency.

On the other hand, look at the settlers of New England, who for several generations proscribed almost entirely the two luxuries—or let us say—*curse*s. They grew stronger and stronger from generation to generation in every element of national greatness. Their abstinence and their attention to the laws of health have produced the most active, enterprising, and vigorous people on the face of the earth.

It is worthy of note that prize-fighters, in training for their brutal exhibitions, abstain entirely from alcohol and tobacco. We may learn a lesson even from *them*.

We would press this view of the subject on young men especially, and also on those whose duty it is to guide the young by precept and example. Not many years ago the Council of Berne, in Switzerland, recognized the principle contended for, by prohibiting tobacco to all youths under fifteen years of age. More recently the French minister of public instruction, after classifying the pupils of a college into smokers and non-smokers, finding the latter to be the best students, contemplated the prohibition of the use of tobacco in all the colleges of France.

The laws of health are laws of God. No man can violate them without committing wrong. He sins not only against himself but against his progeny. No principle in physiology is better established than this: Abuse of the bodily appetites injures the organization, and the

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improve their stock they take pains to pro-
als with wholesome food, and to avoid every
to impair their health or vigor. Nothing
nothing that is even *suspected* of being
permitted to enter the mouth of the favorite
beast. What a blessing it would be to Christendom if
parents every-where would take as much care *for* their
children and *of* their children as farmers do with their
horses and oxen and hogs! Tobacco and strong drink
would then be banished from the civilized world!

III. EFFECTS ON THE MIND.

We have dwelt at greater length on the physical
effects of tobacco, because intellectual and moral injury
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On the other hand, in England, who for several entirely the two luxuries—grew stronger and stronger in every element of abstinence and their attention have produced the most active, and virtuous people on the face of the earth.

It is worthy of note that prize-fighters, their brutal exhibitions, abstain from wine and tobacco. We may learn a lesson from them.

We would press this view of the matter upon men especially, and also on those who guide the young by precept and example. Twenty years ago the Council of Berne, in Switzerland, adopted the principle contended for, by prohibiting the sale of tobacco to all youths under fifteen years of age. More recently the French minister of public instruction, after classifying the pupils of a college into smokers and non-smokers, finding the latter to be the best students, contemplated the prohibition of the use of tobacco in all the colleges of France.

The laws of health are laws of God. No man can violate them without committing wrong. He sins not only against himself but against his progeny. No principle in physiology is better established than this: Abuse of the bodily appetites injures the organization, and the

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injury passes down to the progeny. Many times, when the organization of the parent shows no mark of evil, the evil is developed in the child. The sins of the father may be visited on his children, while he himself may escape all visible punishment. Of three hundred idiots in the State of Massachusetts whose history could be traced, one hundred and forty-five were the offspring of parents one or both of whom were intemperate. In a single family where both father and mother were drunkards there were seven idiotic children!—DR. HOWE.

The breeders of cattle recognize the law which we have stated, and observe it in a practical and rational manner. To improve their stock they take pains to provide the animals with wholesome food, and to avoid every thing liable to impair their health or vigor. Nothing poisonous, nothing that is even *suspected* of being hurtful, is permitted to enter the mouth of the favorite beast. What a blessing it would be to Christendom if parents every-where would take as much care *for* their children and *of* their children as farmers do with their horses and oxen and hogs! Tobacco and strong drink would then be banished from the civilized world!

III. EFFECTS ON THE MIND.

We have dwelt at greater length on the physical effects of tobacco, because intellectual and moral injury must of necessity result from physical injury. The

brain is the organ of the mind. A sound mind requires, if not a sound body, at least a sound brain. With that organ or implement the mind does all its work. And how shall the work be well done with an imperfect or damaged tool?

The effect of tobacco on the memory, under certain circumstances, has already been noticed. It is not to be supposed that memory alone should suffer, and that the other faculties can escape. In extreme cases the reason is dethroned. In the Annual Report of the Massachusetts General Hospital for 1843 eight cases of insanity are ascribed to the excessive use of tobacco, and four cases in the Report of the Pennsylvania Insane Hospital for 1849.

Physicians who have practiced medicine in the border States and on the Pacific Coast have had the best opportunity to observe both the bodily and mental effects of tobacco. In the excitements incident to those localities, without the enjoyments and restraints of home and of female society, men give up much more to the mastery of the lower appetites. There one beholds the victims of indulgence hanging round the door of the physician, or running from one to another for relief, or decoyed into the dens of advertising impostors whose trade it is to frighten timid people into their toils by acting the alarmist through the newspapers. Thin and haggard; nervous, trembling, restless, and sleepless; timid, apprehensive, irresolute, and desponding—no language can

define their sufferings. Not that tobacco is the sole cause, nor always the principal cause, of their troubles; but, like a wily foe watching its opportunity, it comes in at the critical moment when it has power to turn the scale against the wretched victim; and then, like a millstone about his neck, it prevents him from ever raising his head above the waves of despair. And so health and hope and money and manhood all pass away together, and nothing is left for him but death by the road-side, or in the hospital, or in the mad-house. How many mothers mourn their sons, widows their husbands, who have trod this path of sorrows to the bitter end in the far-off land of gold!

An eminent English surgeon writes: "I have invariably found that patients addicted to tobacco-smoking were in spirit cowardly, and deficient in manly fortitude to undergo any surgical operation."—LIZARS. How is it possible for men with impaired digestion and unstrung nerves to exhibit fortitude and self-control?

Loss of time is no small item in the account. Lord Stanhope calculated that in forty years, two years were dedicated by a snuffer to tickling his nose, and two to blowing it. A generous smoker will devote a much larger proportion of time than this to his cigar or pipe. But that is a trifle compared with the sacrifice of time which grows out of the bodily indolence and the aversion to intellectual activity begotten by the habit.

Tobacco is conducive to indolence, both physical and mental. Repose or inaction is required for the full enjoyment of the cigar. Men will tell you that in order to think continuously on any subject they lay aside the pipe. Employers do not want a workman with a pipe in his mouth. It dissipates the attention—not concentrates it. Though opposite statements are made by men addicted to the practice, yet the balance of testimony is largely in favor of the view that it unsettles and enfeebles the mind.

To meet this argument instances are adduced of great men—generals, statesmen, and philosophers—who were inveterate smokers or chewers or snuffers. But who pretends that tobacco made them great, or added to their intellectual power? The most that can be said is, that it did not destroy or impair in a sensible degree their mental vigor; that they were great in spite of it. Such cases are at best exceptions, which prove nothing against the general law. Medical writers assure us that but a small proportion of persons bitten by rabid animals are attacked with hydrophobia. Yet who would run the risk of a bite because there may be fifty chances of escape to one of seizure with the horrible disease!

There is another point to be considered. Some intellectual men are unable to exert their minds without tobacco, merely from the slavery of habit. Habits always tend to grow into necessities. The man who

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Does this prove that uproar is anodyne?
disturbs sleep?

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lant? Or rather does it not demonstrate that they have
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of disease? and that they need to break the galling
chain, and place themselves under the influence of the
laws of nature and of health, to be restored, if possible,
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Samuel Johnson, Frederick the Great, and Napoleon

Tobacco is conducive to indolence, mental. Repose or inaction is required for enjoyment of the cigar. Men will tell you they cannot think continuously on any subject without a pipe. Employers do not want a workman with a pipe in his mouth. It dissipates the attention and distracts it. Though opposite statements are made by those addicted to the practice, yet the balance is largely in favor of the view that it weakens the mind.

To meet this argument instances are adduced of great men—generals, statesmen, and philosophers—who were inveterate smokers or chewers or snuff-takers. It is pretended that tobacco made them great, or that it increased their intellectual power? The most that can be said is that it did not destroy or impair in a sensible

degree their vigor; that they were great in spite of it. Such cases are at best exceptions, which prove nothing against the general law. Medical writers assure us that but a small proportion of persons bitten by rabid animals are attacked with hydrophobia. Yet who would run the risk of a bite because there may be fifty chances of escape to one of seizure with the horrible disease!

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In view of the above

is used to sleeping in a mill, or with his head nearly in contact with a noisy steam-engine, will be roused instantly from his slumber by the stopping of the mill or of the engine. Does this prove that uproar is anodyne? or that stillness disturbs sleep?

The young girls of Styria eat arsenic in large quantities to beautify their complexion. The men give it to their horses to improve their coats and to make them long-winded; and they themselves eat it for the latter purpose. The habit is formed by slow degrees, and when once established cannot be suddenly abandoned. The moment it is suspended symptoms of poisoning from arsenic make their appearance, and these symptoms disappear on resuming the use of the poison! Does this prove that the common use of arsenic would be wholesome?

So there are men who can perform much intellectual labor under the influence of a quart of brandy in the day; and without the brandy they tremble and fail. Does this prove that brandy is a useful mental stimulant? Or rather does it not demonstrate that they have made themselves the slaves of habit and the victims of disease? and that they need to break the galling chain, and place themselves under the influence of the laws of nature and of health, to be restored, if possible, by slow recuperation, to a sound and healthy condition.

(Samuel Johnson, Frederick the Great, and Napoleon

were slaves to snuff; and many celebrated men of more recent times have been inveterate smokers. Such examples are frequently cited for imitation, as if greatness were due to the sensual habit. In them nature declares that when man is great in any sphere of action below the highest and purest, he shall still exhibit, in some direction, the weakness of humanity and the mastery of the flesh. Newton refused to smoke because he "would make no necessities to himself." Serene and self-possessed and contemplative minds like his, which rise above the ordinary passions and pursuits of the world, and are almost capable of grasping the problem of infinity, can derive no aid from any of the master vices. They are masters of their own household, and rulers over their own appetites and propensities. Theirs alone is true greatness. They illustrate the sound maxim of Christian philosophy, that "he that ruleth his spirit is better than he that taketh a city."

The law which applies to the use of tobacco, alcohol, opium, and other narcotics and stimulants, is this: If the sudden abandonment of the habit produce discomfort or disease, that discomfort or disease indicates the amount of injury which the agent has inflicted.

IV. MORAL EFFECTS.

The use of tobacco tends to vitiate the sense of taste, and to create unnatural and morbid thirst,

gives some other means of gratification than
and wholesome beverage provided by the
In this way it leads to the use of strong drink,
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Bad habits do not go singly; they are gre-
one brings another of its kind. The man who
self-control in one respect is less his own master
in another. There is no slavery more relentless than
tobacco—no chain harder to break. Even the
will of the drunkard is often more easily overcome.

Tobacco leads away from good company, and
from virtuous company. From the family circle and from
the society of virtuous females it is often excluded:
from corrupt society *never*. The young man who takes
in his mouth a cigar or pipe, turns his back forth-
with on the sanctuary of home and on the temple of
religion, and sets his face toward the saloon, the bar-
room, the grog-shop, the gambling-house, the brothel.
The path of abstinence leads in the direction of sobriety,
domestic enjoyment, chastity, and religion. The path
of indulgence, to idleness, tippling, profanity, and licen-
tiousness.

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were slaves to snuff; and many celebrated in recent times have been inveterate smokers. Examples are frequently cited for imitation, as were due to the sensual habit. In them nature teaches that when man is great in any sphere of action, the highest and purest, he shall still exhibit, in action, the weakness of humanity and the weakness of flesh. Newton refused to smoke because "it made no necessities to himself." Serene and contemplative minds like those of the ancients rise above the ordinary passions and pursue their world, and are almost capable of grasping the idea of infinity, can derive no aid from any of the vices. They are masters of their own household, rulers over their own appetites and propensities; and alone is true greatness. They illustrate the spirit of Christian philosophy, that "he that ruleth his spirit is better than he that taketh a city."

The law which applies to the use of tobacco, alcohol, opium, and other narcotics and stimulants, is this: If the sudden abandonment of the habit produce discomfort or disease, that discomfort or disease indicates the amount of injury which the agent has inflicted.

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The use of tobacco tends to vitiate the sense of taste, and to create unnatural and morbid thirst,

which craves some other means of gratification than the pure and wholesome beverage provided by the Creator. In this way it leads to the use of strong drink, and becomes the stepping-stone to intemperance.

It has been contended that tobacco is in some degree a substitute for alcohol, and tends to protect from intemperate drinking. But such is not the experience of mankind. Bad habits do not go singly; they are gregarious. One brings another of its kind. The man who loses his self-control in one respect is less his own master in every thing. There is no slavery more relentless than that of tobacco—no chain harder to break. Even the appetite of the drunkard is often more easily overcome.

Besides, tobacco leads away from good company, and into bad company. From the family circle and from the society of virtuous females it is often excluded: from corrupt society *never*. The young man who takes in his mouth a cigar or pipe, turns his back forthwith on the sanctuary of home and on the temple of religion, and sets his face toward the saloon, the bar-room, the grog-shop, the gambling-house, the brothel. The path of abstinence leads in the direction of sobriety, domestic enjoyment, chastity, and religion. The path of indulgence, to idleness, tippling, profanity, and licentiousness.

But why need we argue against the propriety or morality of the practice? Do not its victims them-

selves almost invariably condemn it, and wish that they had never become its slaves, and that they had strength to break their chains? The father who should train his children to chewing or smoking would be considered a monster. And yet every parent who indulges in tobacco is guilty of that sin. Let him preach as he may, his example is infectious, and more powerful than his precept.

Great is the responsibility of every man and every woman in regard to the rising generation. Through the faculty of imitation which is implanted in human nature by the Creator for wise and useful ends, children are drawn toward their seniors by invisible cords, with force that they cannot easily withstand. What they see us do they are inclined to do; and we are under the most solemn obligation as Christians and as moralists to set before them an example which they can follow with safety. In this point of view, what shall be said of the parent who, by his example, lures his offspring into the snare of evil habit? or of the professing Christian or the minister of the Gospel who is seen walking in the street or stepping from a saloon puffing his cigar? What respect has such an individual for that cardinal law of Christianity which requires him to do nothing that shall cause a brother to stumble?

That it is the plain duty of religious teachers, and of every person who acknowledges the obligations of re-

ligion, to shun all conduct which will weaken their influence for good and bring reproach on their profession—to avoid all example which will lead the steps of youth into the path of error and vice—cannot be called in question. The apostolic law, which will forever stand as a test of Christian practice, even forbids the use of “meat” with which custom had associated any thing detrimental to truth or good morals, if the use of it cause a brother to stumble or to go astray. How much more imperative is the obligation to abstain from a baneful superfluity!—baneful to one’s self and baneful to others!

And what shall be said of those who mingle the indulgence with the exercises of public worship? When Frederick the Great, at the coronation of his mother as Queen of Prussia, saw her, during the ceremony, watch the opportunity to take a pinch of snuff, he sent a gentleman to remind her of her place and rank. The King had an inward sense that the act was derogatory to the dignity and solemnity of the occasion. Is a merely human ceremony worthy of greater reverence than the public worship of Almighty God?

If bad habits are gregarious, so are good habits. Children trained in a positive aversion to any evil practice are likely to shun other evil practices. Public sentiment has associated tobacco with strong drink and profanity; and the educators of children wisely seek to implant in the tender conscience a virtuous and active

hostility to this triple alliance of vice. There is sound philosophy in this; for it is as easy to guard against all as against one. With such training, youth are not only fortified against the enemy for their own good, but they are armed for warfare against evil in other shapes, and qualified in a degree to become soldiers in the great army of Christian reform. The hope of a fallen world is in just such an education for the entire coming generation.

On the same principle, men who have fallen into vicious habits can scarcely mend in one respect without advancing toward a general reformation. No matter where they begin, the first lesson of self-control invites to further effort; the first triumph over themselves invites to other victories. We see it illustrated by inebriates who take the pledge of temperance with no other than a selfish aim, and with no design to mend in other ways. But no sooner have they mastered one vice, and broken the chain of one habit, than they feel impelled to go farther; and with more of the spirit of God working in them than they may be conscious of, they proceed to cast off the slavery of tobacco, and to free themselves from the habit of profanity. And so, having entered the straight way, they march onward in light and in joy. By being faithful in little things they become rulers over more.

It will not be denied that the appetite for tobacco

is entirely sensual and animal; that it is associated with the lowest grade of human influences; that it pertains to no endowment which man possesses in distinction from the beast. Therefore it cultivates and strengthens the animal nature at the expense of the intellectual and moral. Its tendency is to degrade the higher qualities of our being.

Man's appetites and propensities are good in themselves, and necessary to the existence and growth of the body. As servants they are in their place, but their mastery is sin. The laws of health and the laws of Christian morality correspond in demanding that they be kept in subjection to the rational and spiritual faculties. He who permits their control not only lowers the dignity of his nature as a rational being, but rebels against the discipline of the school of Christ. The slave of appetite cannot be a Christian.

Persons often cajole themselves with the notion that moderate indulgence is safe, at least *for them*; that *they* are their own masters; that *they* are in no danger of becoming slaves to appetite or habit. But they have no right to tamper with evil, and to enter into temptation. Even admitting that there is no danger to themselves, they break the law in becoming stumbling-blocks to others. Let them reflect that no vicious habit is so easily propagated as the use of tobacco; that it takes root among youth almost invariably from the example

of their seniors; that they cannot indulge without ensnaring and poisoning their own or their neighbor's children.

V. SOCIAL EFFECTS.

The social evils of tobacco are not among the least. Every individual owes to society a certain degree of attention to his personal appearance. He has no right to make himself repulsive to those with whom he comes in contact. He has no right to make himself a nuisance. There is virtue in cleanliness and neatness.

Of all habits to which men are addicted, none so conduces to slovenliness, and to a disregard of the comfort of others, as the use of tobacco. We have known young men who were scrupulously neat in person and attire when they commenced, and who for a long time chewed so moderately and cautiously that few of their friends detected them. We have seen the same individuals a few years afterward with the black streak in the corners of their mouth, and the black stains on their garments.

As chewers and smokers grow careless in person, they become indifferent to those obligations toward others which are enjoined by common politeness. Cautious at first not to offend in smoking or spitting, they gradually abandon restraint, and finally lose altogether that nice sense of propriety which marks the true gentleman in all the relations of life.

We knew a gentleman, or a man who should have been a gentleman, an eloquent popular lecturer, whose fame had gone abroad so that he was invited to lecture in distant places. On these occasions some private family always sought him as their guest. He was an inveterate smoker, and could not even rest in bed without his cigar. The bed, when he left it in the morning, was always strewed with ashes, and the chamber had the stench of a bar-room. He was never invited to a house the second time, and wherever he had made a visit he was remembered by housekeepers as a nuisance.

Chewing is pre-eminently an American vice. Foreigners are quick in observing it, and in noticing the salivary ejections which it occasions. Among other nations the cigar and pipe are most in use. Some years ago a French writer remarked that chewing in France was "confined to a small number of vulgar people, who for the most part are addicted also to intemperance."

Smoking may be regarded as more offensive to others than chewing. The latter may be concealed, the former not. Chewing contaminates the breath, soils the clothing, and defiles the floor; but smoking contaminates the atmosphere to a greater extent, saturates the clothing, and envelops the body in a perpetual cloud of fetid vapor. It is possible for abstainers to avoid in a degree the nuisance of chewing. Not so with smoking. In public assemblies, in public conveyances, in committee-

rooms and in the streets, one is compelled to respire the vitiated air.

A scrupulous regard for the rights and comforts of others is an essential quality of a gentleman, and much more of a Christian. Nothing more forcibly demonstrates the demoralizing influence of tobacco than the carelessness it engenders in this respect. It is the bane of good manners. A few years of its servitude almost annihilates the gentleman. The smoker soon learns to think of himself alone, and ignores the possibility of offending others by constraining them to inhale the nauseous fumes.

The smoke, when drawn into the mouth, absorbs the putrid emanations which it finds there, and diffuses them in the atmosphere. It is disgusting to reflect, as you walk the crowded thoroughfare, and are compelled to take in the fumes of a thousand cigars and pipes, that you are respiring the foul effluvia from decayed teeth and filthy mouths and diseased lungs!

The notices posted up in steamboats, cars, and other public places, to prevent smoking and spitting, convey a severe reproof to all who use tobacco. That it is impossible to restrain some persons within the bounds of decency even by these means, shows with still greater force the baleful influence of the habit in blunting those finer feelings of our nature on which depend the amenities of life.

On the assembling of certain religious bodies it is customary to provide temporary homes for the members in private houses. Nothing is more common than for families, on these occasions, to announce their willingness to accommodate such guests as do not use tobacco. Think of it! ministers of the Gospel excluded from decent homes as nuisances!

The practice of smoking in restaurants is often the source of great annoyance. When the eating-house is kept or frequented by foreigners, Germans and French especially, we may know what to look for; and we may even derive amusement from the gusto with which the cigar is alternated with coffee and lager. But in American restaurants the practice is without excuse; for all Americans know that they are liable to cause discomfort to some one by smoking in public places. No gentleman would think of smoking at a private table, or at the dining-table of a hotel. And no person will smoke under any circumstances where others are eating if he possess the refinement of a true gentleman.

If smokers and spitters would submit to the written laws placarded in steamboats, cars, and other public places, we might censure them the less for disregarding the unwritten laws of polite society. But the demoralizing influence of the habit is so great as often to drive them through all restraints expressed or implied. It is scarcely possible to travel in a public conveyance with-

out encountering this rudeness and boorishness. People with the appearance of gentlemen will stand on the outside of a street car filled with ladies, and ply their pipes or cigars, when the smoke is carried into the car as freely as if they were smoking inside.

So in public assemblages, and in meetings of associations of various descriptions, you will generally find some ill-bred people of this class to puff the nauseating fumes in your face. We have known a scientific association of a score of persons of different nationalities, in which an effort was made by those to whom smoking was offensive to have the practice discontinued at the meetings. The French and German members, who had smoked almost from the cradle, and who never dreamed that smoke could be other than fragrant to all human nostrils, generally abandoned the practice at once. But the prohibition was opposed by several descendants of the Puritans, who were so demoralized by tobacco as to ignore the proprieties of social life.

Few objects are more revolting to a refined sensibility than a human animal reeking with the stench of a bar-room. It is bad enough to carry a cloud of mephitic vapor entangled in the clothing; much worse when, in addition, the breath is fetid with alcohol and tobacco. Nature has provided certain inferior animals with the power of emitting a stench for self-defense. The presence of such an animal may offend the nose, but not

the moral sense. When the stench comes from a human being it is the more abhorrent, because it conveys the idea of moral and physical pollution attached to the image of God.

It is worthy of remark, that when tobacco was first introduced, cleanliness and neatness in the mode of using it were strictly observed. The gentleman of England and France carried about him a neat spittoon, and carefully deposited in it not only the saliva, but also the ashes and stumps. Such a custom at the present day would relieve the practice from some of its disgusting traits.

There is one way in which tobacco interferes with the sacred relations of domestic life. No neat house-keeper wishes her parlor infected with its stench. But if her husband be a smoker he *must* have his smoke. The indulgence has become a necessity. To relinquish it on account of his wife would be an unreasonable sacrifice. He must either leave home and wife for his beloved cigar, or he must impose the annoyance on his family. In either event a base and depraving appetite is allowed to conflict with his sacred duties as the head of a family.

And when the husband leaves his home to take a smoke where does he go? To the saloon! To the bar-room! To the companionship of swearers and gamblers! Not in a single step, of course. But the

moment he leaves his door with a cigar in his mouth he enters the path on which all these are situated. Fortunate man, if he escape them!

The pecuniary cost of the indulgence involves no small amount of social and moral evil. When we consider the immense quantities of tobacco consumed in Europe and America, and the fact that the tax on it forms a large portion of the revenue of some European states—and when we reflect that a large share of this enormous expenditure falls on the laboring classes, who, at best, earn a slender support for their families—the social discomfort which must be engendered by so great a drain becomes painfully apparent. Alas! how many women toil and drudge like beasts that their husbands may enjoy this luxury! How many children shiver and crawl in the dust to supply their father with the indispensable indulgence! And how small the number of men who appear to possess the power, even if they have the will, to deny themselves the gratification for the good of their families!

Writers are wont to dwell with enthusiasm on the merits of tobacco as a luxury to the poor. We should bear in mind that the husband and father is the only one of the family who enjoys usually the luxury. The wife and mother, on whom mainly rests the burden of the family, pursues her round of toil and drudgery by day, and of care and watching by night. For her there is no luxury.

That is monopolized by the strong man who spends the day in healthful and not exhausting labor, and the night in unbroken slumber! Penury and privation may pinch the household, and it is all to be relieved, forsooth, by the father and husband abstracting from their insufficient means that he may drown his care in the narcotic fumes! When we talk of tobacco as a luxury to the poor man let us inquire if he would not suffer much less by applying the money it costs to the wants of his wife and children? whether a man possessing the affections of a husband and a father would not choose to share his pittance with his family rather than give the screw of penury one more turn on wife and children, that he may in some degree smother his own sorrows?

Frequently the cigar attracts idlers. The house of a newly-married pair is the center of a circle of friends, and a pleasant place of resort for young men whose tastes may not be highly intellectual. Thither they go to pass a happy evening, and to enjoy a good smoke. The wife, proud of her partner and flattered by the attentions of his friends, is soon inured to the tainted atmosphere, and giddily and merrily flow the hours away. With the cigars come stimulating drinks. Look forward a few years, and behold how the way that seemed good to those happy young people ends in sorrow and death.

VI. WHAT GOOD DOES IT DO?

We have already exposed the fallacy of the notion that tobacco is a protection against infectious or other diseases. In a few instances it may be useful in preventing toothache and painful affections of the jaw or face, and in preserving the teeth. But these instances are rare. They are exceptions to the general rule.

The fact, however, that it does occasionally cure such disorders, and that it is an active remedy in locked-jaw or some other malady, is the strongest argument against its use as a luxury. Active medicines cannot be used in health without doing harm. This is a well-established law. No sensible person would swallow a dose of medicine in health, for the reason that it is capable of curing sickness. The law applies also with great force to alcoholic drinks. It has a twofold bearing in both cases. First: both tobacco and alcohol, being active medicinal agents, must be injurious to the healthy body. Second: neither of them can be useful as a medicine to persons accustomed to them in health. For the abstainer, and for him alone, have they any healing virtue in sickness.

"Tobacco aids digestion," it is said. "After a hearty meal, the cigar or pipe lightens the burden of the stomach, or enables that organ more readily to get rid of its heavy load." In other words, it helps the glutton

out of trouble! A sound stomach needs no assistance to digest a proper meal of wholesome food.

Some persons are fond of declaiming against intemperance in eating as a set-off to excess in other respects. The truth is, intemperance in one thing does not prevent intemperance in other things, but conduces to it. The glutton, so far from stopping with a gorged stomach, goes on to drinking and smoking. And here again the fraternity of evil habits is exhibited, and tobacco is known by the company it keeps.

There is no question that tobacco stimulates the salivary glands of the mouth and stomach, and by increasing the supply of gastric fluid sometimes facilitates the digestion of food. But it gives no strength to the organ of digestion. On the contrary, it evokes the strength already possessed, and in this way exhausts it. It acts precisely as the whip or spur to an overburdened horse. The beast is excited to exertion for the moment, but always at the expense of his permanent strength. So do all stimulants lash the stomach to exhaustive and enfeebling efforts. By and by, like the whipped horse, it breaks down; and then comes dyspepsia with its countless and life-long train of tortures.

It is quite probable, however, that the benefit of the cigar after a full meal is due rather to the repose of body and mind which it induces, and which is favorable

to digestion. The custom of "bolting" the food—we might almost say the *American* custom—is highly detrimental. It lays the foundation for much disease. The stomach has no teeth, and cannot with impunity be subjected to the imposition of grinding the food as well as digesting it. The practice of rushing into active pursuits immediately after a full meal is also very injurious. Here the cigar is useful by the indolence it engenders; though it were more creditable to an intellectual being to accomplish the result under the control of reason. If men will swallow their food without mastication, like the beast of the field, they should imitate the beast in the subsequent repose.

It is said that tobacco lightens the toil of the laborer; comforts the soldier and the sailor in their fatigue and watching, and, in short, that it is every-where a solace and a blessing in poverty, weariness, and trouble. That it brings relief and comfort to those who have trained themselves to depend on it for relief and comfort is measurably true. But the suffering it relieves is the suffering it has created. It is a blessing only where it has first become a curse. Persons who avoid the habit never suffer the want.

So it is with the habit of drinking; of opium-eating; so it is with all bad habits. They create an artificial want, which is in itself a source of distress, the relief from which is called enjoyment. It is the enjoyment of

the offending boy when the whipping is over; of the prisoner released awhile from the dungeon.

"You do not know what enjoyment you lose by not chewing," said a gentleman to his friend while deliberately stowing away a quid. "And *you* do not know what enjoyment you lose by chewing," was the answer. Discomfort is the normal condition of the victim of the habit, and the only comfort he feels is when under its unnatural influence. The normal condition of the abstainer is that of comfort and health; and it is unalloyed by the torment of perpetual craving.

The general testimony of navigators, military commanders, and employers of every kind who have charge of men exposed to fatigue and hardship, is in favor of those men who have not contracted the appetite for tobacco and alcohol. Other circumstances being alike, abstainers possess a more healthy organization, and are better able to endure privation and fatigue. The Duke of Wellington, in his French campaign, complained of the excessive use of tobacco by his soldiers, and attempted to restrain it. Considering his character as a practical man this fact is not without significance.

During the activity of the bodily organs their substance is destroyed or consumed by a process analogous to combustion; and in the period of repose restoration takes place by the deposit of new material, which is conveyed in the blood. It is argued in favor of tobacco

that it retards the process of combustion, and enables the person using it to perform more labor without waste of the material of the body. The same is urged in defense of alcoholic drinks. When we reflect that the combustion and waste are a natural result of action, their suspension must be unnatural, and in violation of the laws of health. The argument therefore answers and condemns itself.

When a lamp is exhausted we supply it with oil. Without oil a temporary flame may be produced by raising the wick; but the wick itself is consumed. So with the lamp of life, when instead of food we resort to stimulants. There is always a penalty lying in wait.

An argument in favor of tobacco is deduced from the universality of the habit. All nations are prone to the use of stimulants. Some have their opium, others their hasheesh or coca, others again their alcohol and tobacco. Hence, it is argued, these substances supply a natural want, and are in harmony with the design of Providence.

If such logic be sound, all that is necessary to justify any practice whatever is its general prevalence. Vice becomes virtue by its universal spread; and any habit or indulgence which masters the human family must be of divine authority!

But it is not true that the articles in question supply

a *natural* want. The proposition is exactly the reverse of truth. Nature has no craving for tobacco. It is revolting and disgusting in the highest degree to the natural appetite. The Creator has stamped aversion to it on every human palate. His unwritten law forbids its use.

The nations of antiquity were not supplied with these means of indulgence. True, some of them had their wines; but neither sacred nor profane history gives proof that wine-drinking was a source of strength and greatness. The physical energies of the old nations were developed on wholesome food and wholesome drink. The Samsons of ancient days used neither whisky nor tobacco; nor did Hannibal dissolve the Alps with such agents.

If the use of tobacco indicate a natural want, why are women exempt? How comes it that men alone require it? Has the wife of the laboring man no burdens to bear? Look into the cottage of the poor, and see the wife and mother commencing her daily toil at dawn, and laboring on without limit of eight, or yet of ten hours, and sinking at last on her couch without even the blessing of undisturbed sleep to restore her strength! Thus, in the weary path of poverty she struggles onward, unsustained by luxuries or stimulants; while her lordly and rugged husband is so exhausted by a few hours labor as to require the lethean pipe in addition to a long night of unbroken sleep.

It is surprising to what extent men come to regard their habits as necessities: how habit enslaves body and mind; how it perverts the judgment and subsidizes the reason. In regard to others the vision is clear; it is easy to see the deformities and errors of habit in *them*. If smokers and chewers were to find their wives and daughters following their example, would they encourage the practice? And if tobacco supply a natural want, why should not our wives and daughters smoke and chew and spit?

That women do not differ from men in this respect; that they possess the same aptitude and are capable of the same want, we know from the present examples of Spain and Mexico, and from the history of our own ancestry. Our English grandmothers once smoked the pipe in the theater instead of eating apples or pea-nuts; and when snuffing came in fashion the aristocratic ladies of Britain fed their noses with "mundungus." Even at their grand entertainments the ladies of the nobility could not dispense with snuff; and they wore gloves with a slit in the thumb and finger, the better to handle the ambrosial dust. It was written two centuries ago:

"She that with pure tobacco will not prime
Her nose, can be no lady of the time."

There are persons now living who can look back to their grandmothers, and call to mind their perpetual



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and necessities as men in regard to the habitual use of stimulants and narcotics; and that nothing is required but *use* to make both sexes slaves alike. Happily fashion, for once taking the side of reason, has driven the vile custom out of female society. Would to Heaven that the same capricious tyrant would co-operate with reason in driving it from the society of men!

The argument on the utility of tobacco might be summed up in a single consideration: If it be useful, the advantages should be exhibited by comparison of individuals who use it with those who do not. The same comparison may be extended to different communities. Our own country supplies abundant means for the application of the test. Let a hundred chewers or smokers be placed side by side with an equal number of abstainers, both taken indiscriminately from the same community. Again: select portions of the United States where the habit most prevails, and other portions where it least prevails, and compare them in

It is surprising to regard their habits as necessary to their body and mind; how it perverts reason. In regard to the deformities it produces, it is easy to see the deformities it produces in them. If smokers and chewers, wives and daughters following them, they encourage the practice? And if it is a natural want, why should not our daughters smoke and chew and spit?

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built (Hove & Spayelle)
Maiden in June 29
evening. will answer
well for our problem

cramming of their nostrils with snuff, even over the dough-trough, their dusted garments and their nasal voice. To this day there are sections of our country where "rubbing" or "dipping" is a habit common among females of good society! where pulverized tobacco takes the name of tooth-powder, and is more indispensable to the toilet than soap! Indeed, there can be no doubt that women have the same appetites, capacities, and necessities as men in regard to the habitual use of stimulants and narcotics; and that nothing is required but *use* to make both sexes slaves alike. Happily fashion, for once taking the side of reason, has driven the vile custom out of female society. Would to Heaven that the same capricious tyrant would co-operate with reason in driving it from the society of men!

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the physical development and vigor of the population, in industrial prosperity, in enterprise, morals, refinement; in every thing that marks the progress and exaltation of the human race. We should be content to leave the verdict with a jury of smokers and chewers.

VII. CONCLUSION.

In the foregoing pages we have described the general influence of tobacco on man, showing that it impairs digestion, poisons the blood, depresses the vital powers, causes the limbs to tremble, and weakens and otherwise disorders the heart; that it robs the poor man's family; that it is adverse to personal neatness and cleanliness; that it promotes disregard for the rights and comforts of others; that it cherishes indolence of body and mind; that it diminishes the vigor of intellect; that it destroys self-control by establishing the slavery of habit; that it develops the lower and animal nature at the expense of the higher; that it entails physical and moral degeneracy upon the offspring; that it leads into bad associations and bad company, and throws its influence in the scale of evil in all the relations of life. We have maintained that the good it seems to do is imaginary, and not real, and the evils it appears to remove are those of its own making. In sustaining these charges we call up as witnesses all intelligent people who are not its victims, and a very large proportion of those who are, and

who condemn it from their own experience. We are entitled to discard the testimony in its defense of all persons addicted to its use, and who are consequently interested parties, biased by appetite, and pleading for a master as servants and slaves.

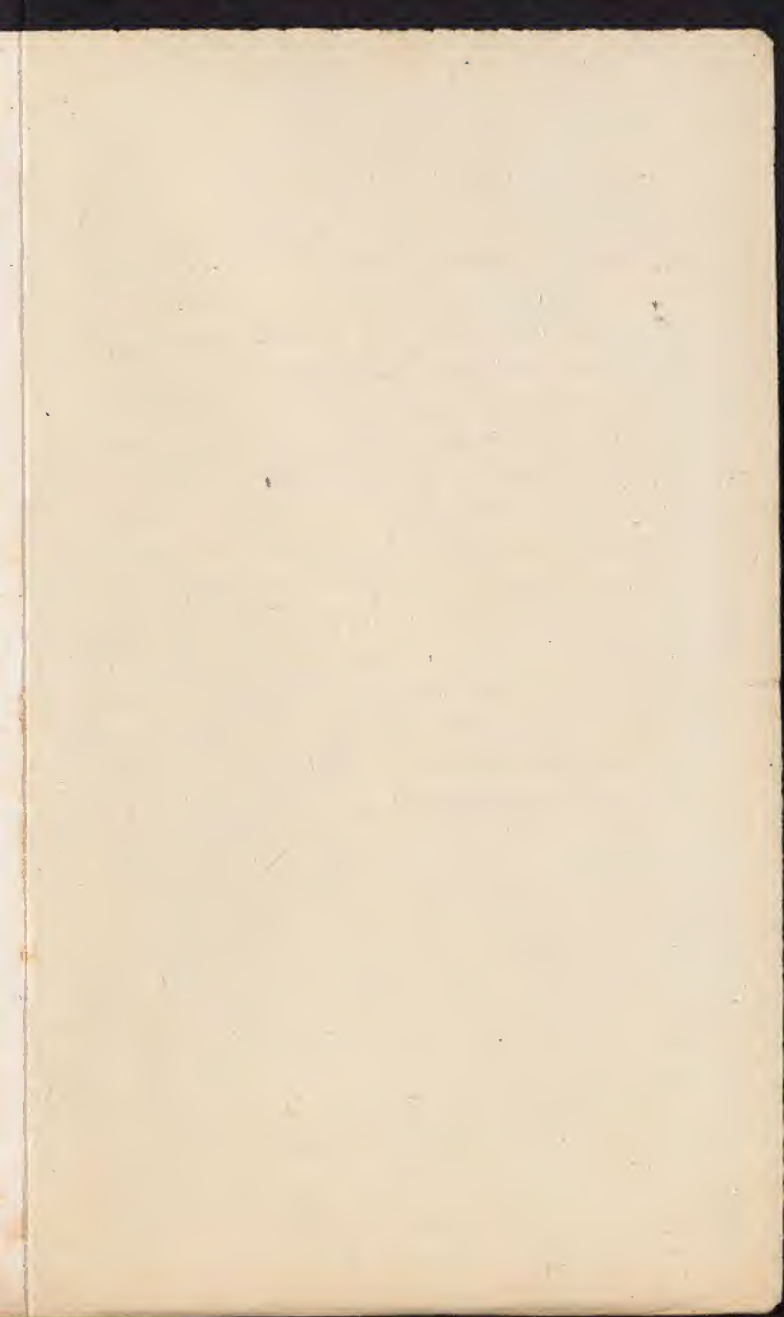
It is idle to distinguish between moderation and excess. The evil is in the thing itself. There is no temperance or rightful moderation in error or vice. There is no lawful indulgence in a bad habit. Temperance requires entire abstinence from things hurtful. Every use of poisons in health is an abuse.

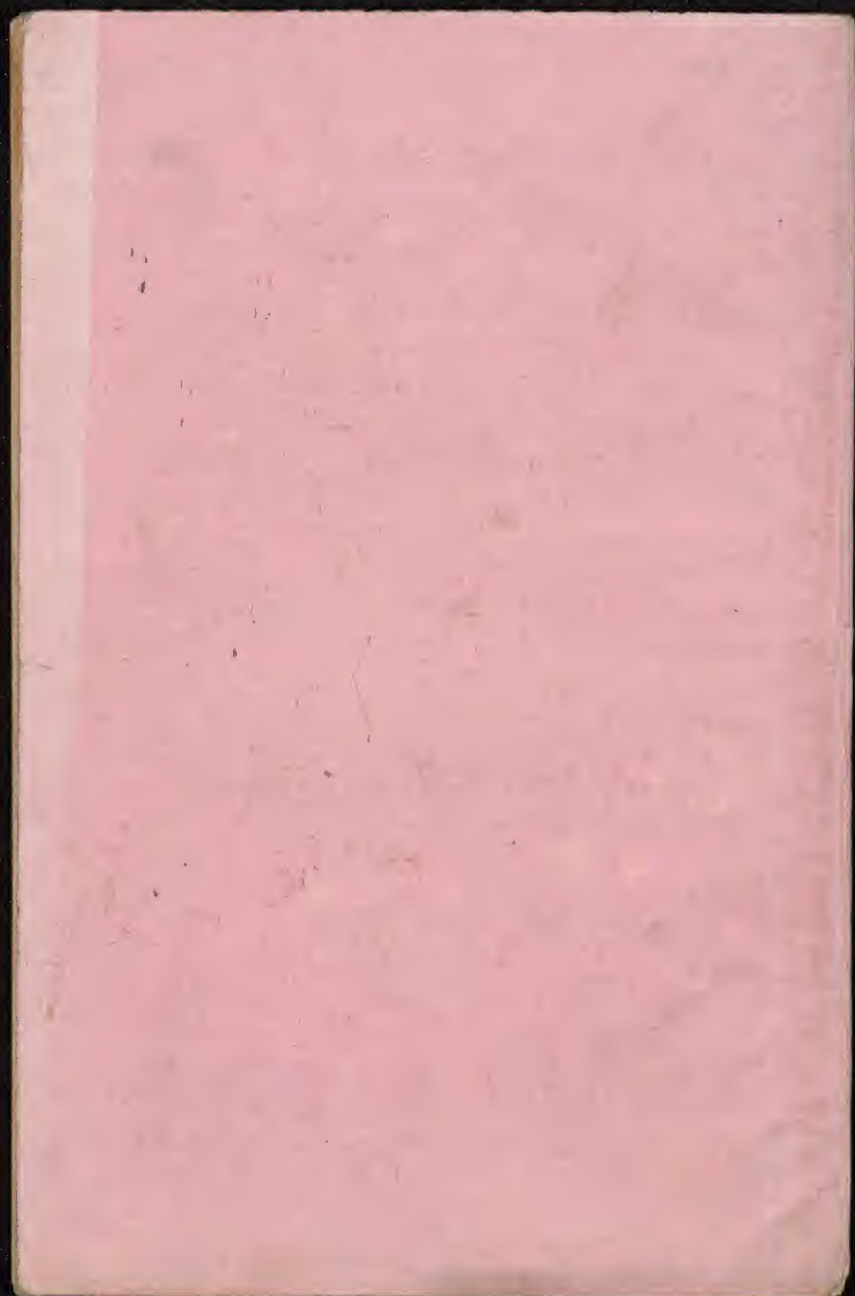
In view of a great physical and moral evil, so extensive and all-pervading, what is the plain duty of men, as parents, as citizens, as patriots? Abstinence, of course; to avoid it themselves, and to avoid leading others astray by example. But is this all? Is it enough to fold one's arms in security, and to do no positive wrong? Can we escape our just obligations without pursuing a positive and active warfare against this and other pernicious customs?

Of all bad habits none are more incurable than those created by tobacco and alcohol; of all depraved appetites none hold their victims with more deadly grasp. So difficult and so uncertain is reform, that, were it not for the discipline of soul which the Christian reformer derives from the effort, he might drop his hands in despair and leave the victims to their fate. And here

we learn from the difficulty of cure the importance and necessity of prevention. Here is the true policy, here the true field of labor. Children must be rightly trained; not yours and mine alone, but the whole generation. In this work, all that is done is badly done if any thing be left undone. To exclude small-pox from a community it is not enough to vaccinate a part of the children. The general safety requires that all should be protected alike. So we must imbue the entire rising generation with hostility against tobacco. We must educate them to it from infancy. We must baptize their tender hearts with abhorrence of the vicious habit. While schooling children in this manner, we are doing much more. We are drawing them away from a thousand vices, and training them in the whole body of virtue. We are planting the seed which, for aught we know, will yield a harvest of everlasting life.

THE END.





• • In truth, the soldier is the last man in the world who should smoke; for the simple reason, that while he, more than any other man, has need of all his strength, smoking robs him of part of it. It is not science alone which establishes this truth. The winning boat of Harvard University, and the losing boat of Yale, were not rowed by smokers. One of the first things demanded of a young man who is going into training for a boat-race is, *Stop smoking!* And he himself, long before his body has reached its highest point of purity and development, will become conscious of the lowering and disturbing effect of smoking one inch of a mild cigar. No smoker who has ever trained severely for a race, or a game, ~~or a fight~~ needs to be told that smoking reduces the tone of the system and diminishes all the forces of the body. He *knows* it. He has been as conscious of it as a boy is conscious of the effects of his first cigar. Let the Harvard crew smoke during the last two months of their training, and let the Yale men abstain, and there is one individual prepared to risk a small sum upon Yale's winning back her laurels.

A soldier should be in training always. Compelled to spend nine tenths of his time in laboriously doing nothing, he is called upon, occasionally, for a few hours or days or weeks to put forth exertions which task human endurance to the uttermost. The soldier, too, of all men, should have quiet

He should every man, — in the true sense of training, including all the power, — of brain & nerves as well as muscle.

would have to be kept in what prize-fighters call "condition"; by which term they simply mean the natural state of the body, uncontaminated by poison, and unimpaired by indolence or excess. Every man is in duty bound to be "in condition" at all times; but the soldier,—it is part of his profession to be "in condition." When remote posterity comes to read of the millions and millions of dollars expended during the late war in curing soldiers untouched by bayonet or bullet, the enthusiasm of readers will not be excited by the generosity displayed in bestowing those millions. People will lay down the book and exclaim: "How ignorant were our poor ancestors of the laws of life! A soldier in hospital without a wound! How extremely absurd!"

To this weighty and decisive objection minor ones may be added. The bother and vexation arising from the pipe were very great during the campaigns of the late war. Half the time the smokers, being deprived of their accustomed stimulant, were in that state of uneasy longing which smokers and other stimulators know. Men were shot during the war merely because they *would* strike a light and smoke. The desire sometimes overcame all considerations of prudence and soldierly duty. A man out on picket, of a chilly night, knowing perfectly well that lighting his pipe would have the twofold effect of revealing his presence

he does, and has reduced his daily allowance of cigars. Edwin Booth smokes, as do most of the gentlemen of his arduous profession. Probably a majority of the physicians and surgeons in the United States, under forty years of age, are smokers; and who ever knew a medical student that did not smoke furiously? This, perhaps, is not to be wondered at, since doctors live upon the bodily sins of mankind.

The question is, Does it pay these gentlemen to smoke? *They* know it does not. It would be gross arrogance in any individual to lift up his voice in rebuke of so many illustrious persons, but for the fact that there is scarcely one of them who does not feel that the practice is wrong, or, at least, absurd. Almost all confirmed smokers will go so far as to admit that they wish they had never acquired the habit. Few of them desire their boys to acquire it. None recommend it to other men. Almost all smokers, who are not Turks, Chinamen, or Indians, appreciate at once the wisdom of Sir Isaac Newton's reply to one who asked him why he never smoked a pipe. "Because," said he, "I am unwilling to make to myself any necessities." Nor can any intelligent smoker doubt that the fumes of tobacco are hostile to the vital principle. We smokers and ex-smokers all remember how our first cigar sickened us; we have all experienced various ill effects from what smokers call "smoking too much"; and very many smokers have, once or twice in their lives, risen in revolt against their tyrant, given away their pipes, and lived free men long enough to become conscious that their whole being had been torpid, and was alive again. No, no! let who will deny that smoking is unfriendly to life, and friendly to all that wars upon life, smokers will not question it, unless they are very ignorant indeed, or very young. It will be of no avail to talk to *them* of the man who lived to be a hundred years old and had smoked to excess for half a century. Smokers have that within which keeps them well in mind that smoking is pernicious.

If there are any smokers who doubt it, it is the few whom smoke is rapidly killing; such, for example, as the interesting professional men who smoke an excellent quality of cigars and "break down" before they are thirty-five. It is not honest, legitimate hard work that breaks so many people down in the prime of life. It is bad habits.

Smoking is a barbarism. This is the main argument against what is termed moderate smoking. There is something in the practice that allies a man with barbarians, and constantly tends to make him think and talk like a barbarian. Being at New Haven last September, a day or two before the opening of the term at Yale College, I sat in one of the public rooms of the hotel late one evening, hoping some students would come in, that I might see what sort of people college students are in these times. Yale College hath a pleasant seat. Who can stroll about upon that beautiful College Green, under those majestic elms, without envying the youth who are able to spend four long years of this troublesome life in the tranquil acquisition of knowledge amid scenes so refined and engaging? The visitor is bewitched with a wild desire to give the college two or three million dollars immediately, to enable it to become, in all respects, what it desires, aims, and intends to become. Visions of the noble Athenian youth thronging about the sages of eld, and learning wisdom from their lips, flit through his mind, as he wanders among the buildings of the college, and dodges the colored men who are beating carpets and carrying furniture. In this exalted frame of mind, suppose the stranger seated in the room of the hotel just mentioned. In the middle of the small apartment sat one fat, good-humored, uneducated man of fifty, smoking a cigar, — about such a man as we expect to find in the "office" of a large livery stable. At half past ten a young man strolled in, smoking, who addressed the elder by a military title, and began a slangy conversation with him upon the great New Haven sub-

that such persons might be justified in a habit which only lessens what they have in superfluity. In other words, sailors, being in a situation extremely unfavorable to spiritual life, ought not merely to yield to the lowering influence of the fore-castle, but add to it one more benumbing circumstance. On the contrary, they ought to strive mightily against the paralyzing effects of monotony, — not give up to them, still less aggravate them. There is no reason, in the nature of things, why a sailor, after a three years' voyage, should not step on shore a man more alert in body and mind than when he sailed, and all alive to communicate the new knowledge he has acquired and the wonders he has seen. Why should he go round this beautiful world drugged?

We must, therefore, add the sailor to the hod-carrier and the soldier, and respectfully take away his pipe. I select these classes, because they are supposed most to need artificial solace, and to be most capable of enduring the wear and tear of a vicious habit. Each of these classes also can smoke without much offending others, and each is provided with an "expectoration" which disgusts no one. The hod-carrier and the soldier have the earth and the sailor the ocean. But, for all that, the pipe is an injury to them. Every man of them would be better without it.

But if we must deny *them* the false solace of their pipe, what can be said of the all-but-universal smoking of persons supposed to be more refined than they, and whose occupations furnish them no pretence of an excuse? We now see painters in their studios smoking while they paint, and sculptors pegging away at the marble with a pipe in their mouths. Clergymen hurry out of church to find momentary relief for their tired throats in an ecstatic smoke, and carry into the apartment of fair invalids the odor of ex-cigars. How it may be in other cities I know not, but in New York a parishioner who wishes to confer upon his clergyman a *real* pleas-

ure can hardly do a safer thing than send him a thousand cigars of a good clerical brand. It is particularly agreeable to a clergyman to receive a present which supplies him with a luxury he loves, but in which he knows in his inmost soul he ought not to indulge. No matter for all his fine arguments, there is not one clergyman in ten that succeeds in this short life in reducing his conscience to such a degree of obtuseness that he can buy a box of cigars (at present prices) without a qualm of self-reproach. Editors, writers for the press, reporters, and others who haunt the places where newspapers are made, are smokers, except a few controlling men, and a few more who are on the way to become such. Most of the authors whose names are familiar to the public smoke steadily; even the poets most beloved do so. Philosophers have taken to the pipe of late years. Mr. Dickens, they say, toys with a cigar occasionally, but can hardly be reckoned among the smokers, and never touches a cigar when he has a serious task on hand. Mr. Prescott smoked, and O, how he loved his cigar! It was he who, when his physician had limited him to one cigar a day, ran all over Paris in quest of the largest cigars that Europe could furnish. ~~In my smoking days I should have done the same.~~ Thackeray smoked; he was very particular in his smoking; the scent of a bad cigar was an abomination to him. That Byron smoked, and loved "the naked beauties" of tobacco, he has told us in the most alluring verses the weed has ever inspired. Milton, Locke, Raleigh, Ben Jonson, Isaac Walton, Addison, Steele, Bolingbroke, Burns, Campbell, Scott, Talfourd, Christopher North, Lamb, were all smokers at some part of their lives. Among our Presidents, John Adams, John Quincy Adams, General Jackson, and probably many others, were smokers. Daniel Webster once smoked. Henry Clay, down to a late period of his life, chewed, smoked, and took snuff, but never approved of either practice, and stopped two of them. General Grant smokes, but regrets that

pect, — yellowish in color, with a dull shine upon them. You perceive plainly that it is not well with these good people; they are not conforming to nature's requirements; they are not the Germans of Tacitus, — ruddy, tough, happy, and indomitable. To lay the whole blame of this decline upon smoking, which is only one of many bad habits of theirs, would be absurd. What I insist upon is this: Smoking, besides doing its part toward lowering the tone of the bodily health, deadens our sense of other physical evils, and makes us submit to them more patiently. If our excellent German fellow-citizens were to throw away their pipes, they would speedily toss their cast-iron sausages after them, and become more fastidious in the choice of air for their own and their children's breathing, and reduce their daily allowance of lager-bier. Their first step toward physical regeneration will be, must be, the suppression of the pipe.

One hopeful sign for the future is, that this great subject of the physical aids and the physical obstacles to virtue is attracting attention and rising into importance. Our philanthropists have stopped giving tracts to hungry people; at least, they give bread first. It is now a recognized truth, that it takes a certain number of cubic yards for a person to be virtuous in; and that, consequently, in that square mile of New York in which two hundred and ninety thousand people live, there must be — absolutely *must* be — an immense number of unvirtuous persons. No human virtue or civilization can long exist where four families live in a room, some of whom take boarders. The way to regenerate this New York mile is simply to widen Manhattan Island by building three bridges over the East River, and to shorten the island by making three lines of underground or overground railroad to the upper end of it. We may say, too, there are circles — not many, it is true, but some — in which a man's religion would not be considered a very valuable acquisition,

if, when he had "got" it, he keep on chewing tobacco. Such a flagrant and abominable violation of the Creator's laws, by a person distinctly professing a special veneration for them, would be ludicrous, if it were not so pernicious.

The time is at hand when these simple and fundamental matters will have their proper place in all our schemes for the improvement of one another. The impulse in this direction given by the publication of the most valuable work of this century — Buckle's "History of Civilization in England" — will not expend itself in vain. If that author had but lived, he would not have disdained, in recounting the obstacles to civilization, to consider the effects upon the best modern brains of a poison that lulls their noblest faculties to torpor, and enables them languidly to endure what they ought constantly to fight.

It is not difficult to stop smoking, except for one class of smokers, — those whom it has radically injured, and whose lives it is shortening. For all such the discontinuance of the practice will be almost as difficult as it is desirable. No rule can be given which will apply to all or to many such cases; but each man must fight it out on the line he finds best, and must not be surprised if it takes him a great deal longer than "all summer." If one of this class of smokers should gain deliverance from his bondage after a two years' struggle, he would be doing well. A man who had been smoking twenty cigars a day for several years, and should suddenly stop, would be almost certain either to relapse or fall into some worse habit, — chewing, whiskey, or opium. Perhaps his best way would be to put himself upon half allowance for a year, and devote the second year to completing his cure, — always taking care to live in other respects more wisely and temperately, and thus lessen the craving for a stimulant. The more smoke is hurting a man the harder it is for him to stop smoking; and almost all whom the

things here for the widespread, increasing propensity to smoke. As all the virtues are akin, and give loyal aid to one another, so are all the vices in alliance, and play into one another's hands. Many a smoker will discover, when at last he breaks the bond of his servitude, that his pipe, trifling a matter as it may seem to him now, was really the power that kept down his whole nature, and vulgarized his whole existence. In many instances the single act of self-control involved in giving up the habit would necessitate and include a complete regeneration, first physical, then moral.

Whether the Coming Man will drink wine or be a teetotaler has not yet, perhaps, been positively ascertained; but it is certain he will not smoke. Nothing can be surer than that. The Coming Man will be as healthy as Tecumseh, as clean as Shirley, and as well groomed as Dexter. He will not fly the female of his species, nor wall himself in from her approach, nor give her cause to prefer his absence. We are not left to infer or conjecture this; we can ascertain it from what we know of the messengers who have announced the coming of the Coming Man. The most distinguished of these was Goethe,—perhaps the nearest approach to the complete human being that has yet appeared. The mere fact that this admirable person lived always unpolluted by this seductive poison is a fact of some significance; but the important fact is, that he *could not* have smoked and remained Goethe. When we get close to the man, and live intimately with him, we perceive the impossibility of his ever having been a smoker. We can as easily fancy Desdemona smoking a cigarette as the highly groomed, alert, refined, imperial Goethe with a cigar in his mouth. In America, the best gentleman and most variously learned and accomplished man we have had,—the man, too, who had in him most of what will constitute the glory of the future,—was Thomas Jefferson, Democrat, of Virginia. He was versed in six languages; he danced, rode, and hunted as well as General

Washington; he played the violin well, wrote admirably, farmed skilfully, and was a most generous, affectionate, humane, and great-souled human being. It was the destiny of this ornament and consolation of his species to raise tobacco, and live by tobacco all his life. But he knew too much to use it himself; or, to speak more correctly, his fine feminine senses, his fine masculine instincts, revolted from the use of it, without any assistance from his understanding.

There is no trace of the pipe in the writings of Washington or Franklin; probably they never smoked; so that we may rank the three great men of America—Washington, Franklin, and Jefferson—among the exempts. Washington Irving, who was the first literary man of the United States to achieve a universal reputation, and who is still regarded as standing at the head of our literature, was no smoker. Two noted Americans, Dr. Nott and John Quincy Adams, after having been slaves of the weed for many years, escaped from bondage and smoked no more. These distinguished names may serve as a set-off to the list of illustrious smokers previously given.

Among the nations of the earth most universally addicted to smoking are the Turks, the Persians, the Chinese, the Spanish,—all slaves of tradition, submissive to tyrants, unenterprising, averse to improvement, despisers of women. Next to these, perhaps, we must place the Germans, a noble race, renowned for two thousand years for the masculine vigor of the men and the motherly dignity of the women. Smoking is a blight upon this valuable breed of men; it steals away from their minds much of the alertness and decision that naturally belong to such minds as they have, and it impairs their bodily health. Go, on some festive day, to "Jones's Woods," where you may sometimes see five thousand Germans—men, women, and children—amusing themselves in their simple and rational way. Not one face in ten has the clear, bright look of health. Nearly all the faces have a certain tallowy as-

Queen Charlotte herself was a dear lover of a pinch, and kept her box well filled with best Spanish or violet Strasburg mixed with green tea; and, of course, as long as the first lady in the land set such an example, fashion saw nothing unlady-like in feminine snuffing.

Snuff reigned triumphant all through the Georgian era; high and low alike indulged in it, and endless were the varieties introduced to suit different tastes and purses. A tobacconist's advertisement, dated 1740, enumerates forty-six sorts of snuff, from good Scotch, at two shillings, to best Brazilian, at twenty-four shillings the pound. Perforce, the snuff-box held its own.

Smith, Randolph &

street, quote at 11 o'clock, as follows: Gold, 136½;
United States 1881 Bonds, 110½@110¾; United States
5-20's, 1862, 107¾@107½; 5-20's, 1864, 105½@105¾;
5-20's, 1865, 105¾@106; 5-20's, July, 1865, 107½@
107¾; United States 10-40's, 99@99½; United States
7-30's, 1st series, 105½@105¾; 7-30's, 2d series, 105½@
105¾; 3d series, 105½@105¾; Compounds, December,
1864, 116.

Messrs. De Haven Brother, No. 40 South Third
street, make the following quotations of the rates of
exchange to-day, at 1 P. M.: American Gold, 136½@
136¾; Silver—Quarters and halves, 130; Compound

Notes—June, 1864, 19; July, 1864, 18½

Oct. 1864, 17½; Dec. 1864, 17

Church and theatre alike echoed with the music; snuffing, sneezing, hawking, and grunting spoiled the best speech in a tragedy, and served to distract the attention of congregations from the sermon:

The box is used, the book laid by as dead,
With snuff, not Scripture, there the soul is fed;
For when to Heaven the hands of one of those
Are lifted, twenty have them at the nose.

—A barrel of flour can be purchased in Paris, sent by rail and steamer to Liverpool, and thence transported in a sailing vessel to Boston at less expense than it can now be purchased in the latter city.

—The Yankees of Connecticut have not forgotten their cunning. A Hartford merchant who was shown an old-fashioned wooden nutmeg

Co.

and

&Co.

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abun,

... , Dame Margaret Thompson, who would have sacrificed all the pretty fellows in the world rather than renounce her nasal luxury. This snuff-loving old lady's last will and testament was something unique. It set forth that, as it was usual to put flowers in the coffins of departed friends, as she had never found any flowers so fragrant and refreshing as the precious powder, her trusty servant Sarah was to take care her body was covered with the best Scotch snuff. Six men, the greatest snuff-takers in the parish, were to carry her to the grave; and the half dozen old maids selected to act as pall-bearers, were to be supplied with boxes of snuff wherewith to refresh themselves on the road.

on the street and the market was not
enough for speculative purposes, yet there is no dispo-
sition to make any new ventures, and stocks closed ex-
ceedingly dull. Government Loans were remarkably
quiet. The Policy bonds sold at $107\frac{3}{4}$; the February
Seven-thirties closed at $106@106\frac{1}{4}$; the June and July
do. at $105\frac{1}{2}@105\frac{3}{4}$; the '64's at $105\frac{1}{2}$, and the '65's at
 $105\frac{1}{2}@106$. State Loans were held stiffly. City Loans
of the new issues, sold to a limited extent at $101\frac{1}{2}$.
Reading Railroad was dull at 52. 130 $\frac{1}{2}$ was bid for
Camden and Amboy Railroad; 131 for Philadelphia
and Trenton Railroad; $57\frac{1}{4}$ for Pennsylvania Railroad;
61 for Germantown Railroad; 28 for Little Schuyl-
kill Railroad; 57 for Mine Hill Railroad; $93\frac{1}{2}$ for No-

... great was ... by my Lord
Petersham, who boasted a stock of snuff's worth
three thousand pounds, while his collection of
boxes was something wonderful. He had boxes
adapted to all occasions—boxes for winter wear,
boxes for summer use; indeed, he was popularly
believed to have a different box for every day in
the year.

quality here. The good Red 20 1/2 bushels
bushel, and California at \$3 40. 600 bushels of
Penna. sold at \$3 25 and 500 bushels No. 2 Spring
\$2 75. There is but little Rye coming in and
worth \$1 65@1 70. There is a steady demand
Corn at the advance noted yesterday and further sale
of 4000 bushels yellow, in store, sold at \$1 33, 87

The pleasures of snuff-taking were by no means monopolized by the sterner sex. So early as 1650, it was said;

She that with pure tobacco will not prime
Her nose, can be no lady of the time;

and lovers, like ~~Congreve's Tattle~~, made their first approaches to beauty by laying a snuff-box at her feet. In 1712 we find the *Spectator* stigmatizing snuff-taking as an impertinent custom adopted by fine women, and equally disgusting whether practiced sedately or coquettishly. One took it, a grumbler complains, as often as salt with her meals; another made as much noise as possible while performing the operation; some only used it as a means of displaying their pretty hands; but your thorough-paced woman of fashion

ston 2d

30th ult.

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n, sailed

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never to be purchased,
reason that no such machine as that advertise
by Parker was ever made.

—The New Yorkers are rather inclined to
make fun of their new elevated bridge over
Broadway, as this "personal" in a Sunday paper
will show: "Will the young lady with high
gaiters, red-flannel drawers and satin corsets
that passed over Fulton street bridge at 2 o'clock
Saturday, and kindly noticed the gentleman with
opera glass who stood at foot of steps; please
meet him under the bridge, Monday evening,
half-past ten."

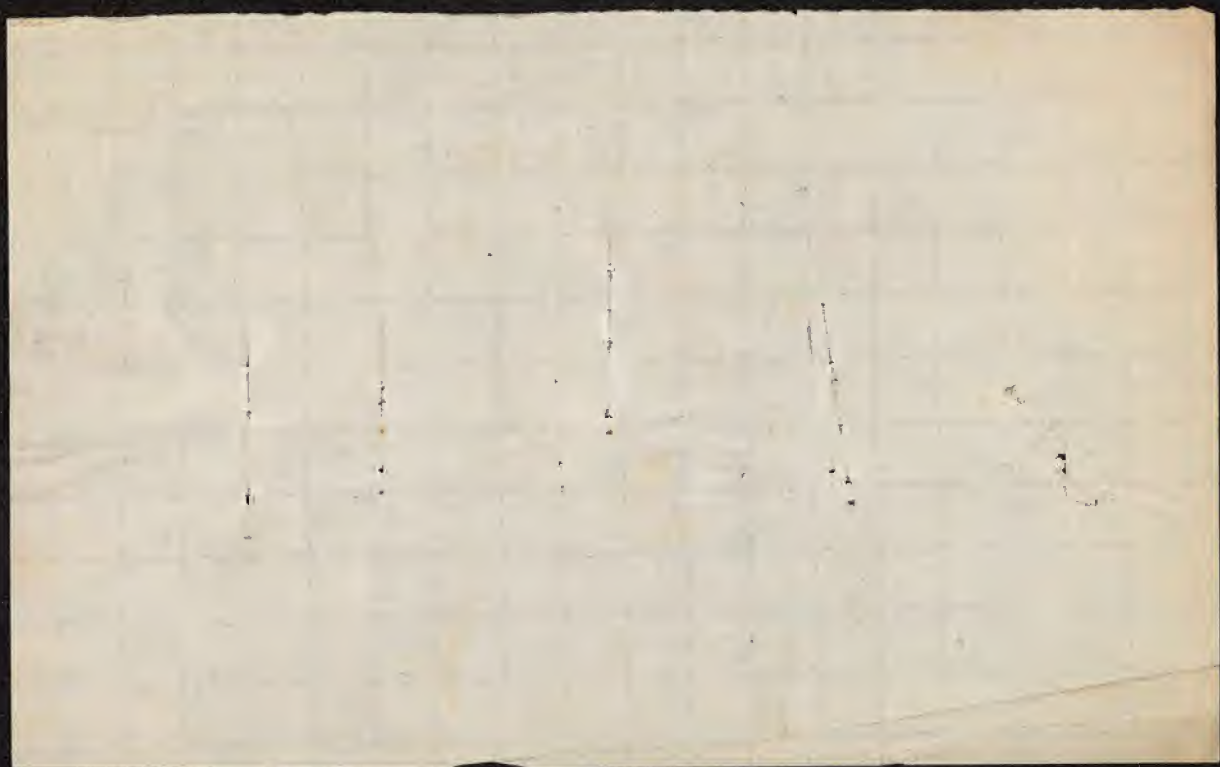
② A member of the Class of 1871 (univ) told me that one dealer
 in a County of North Carolina has sold 40 barrels of snuff in
 a year, all to be used in dipping. The dip-stick is often connected with gold.

Dipping is
 practiced
 also in some
 parts of

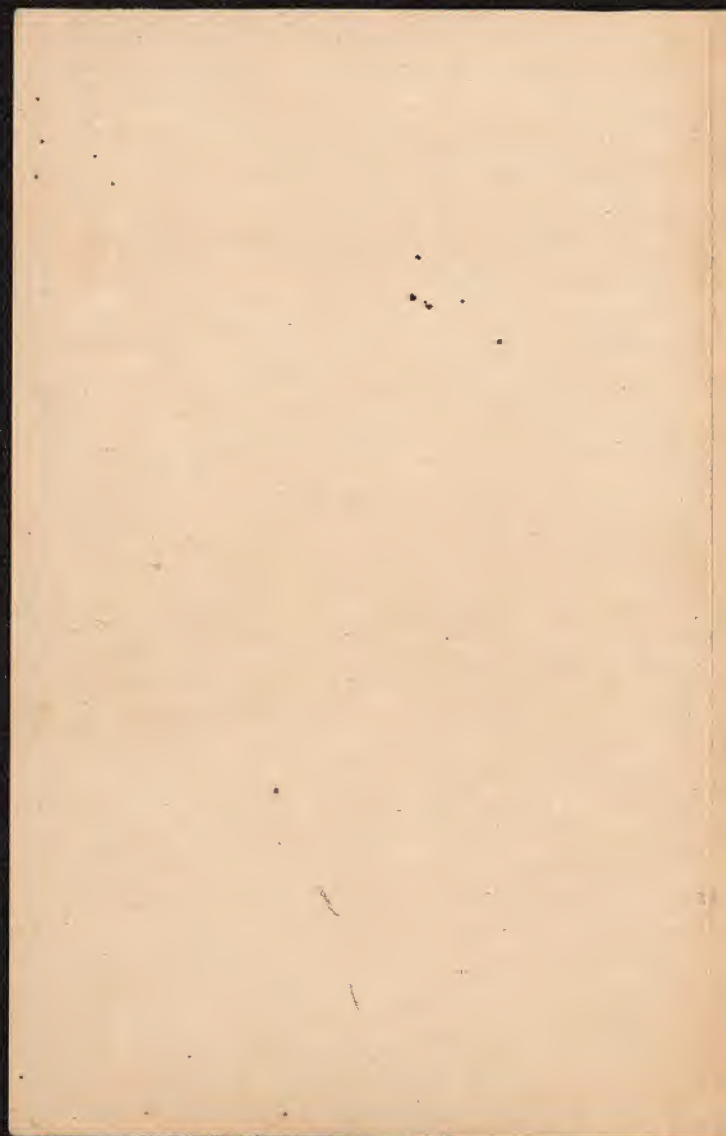
New Jersey

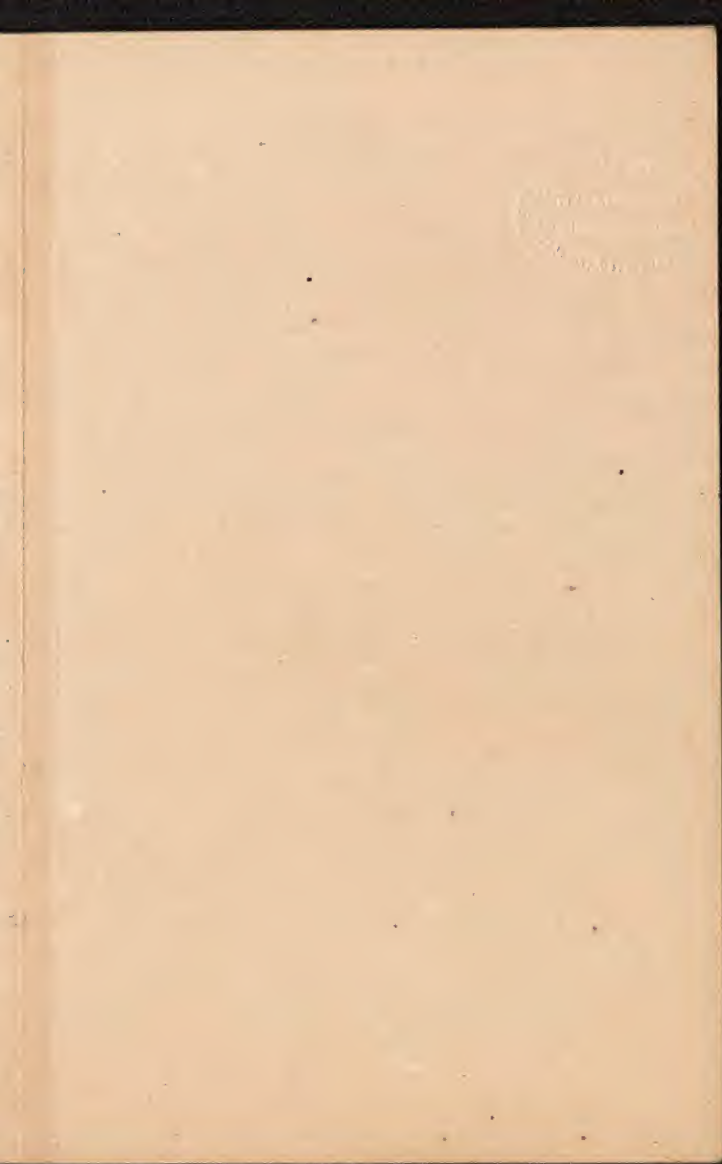
A similar estimate (Kearney) said
 at Richmond, 1871, he had dug out from
 the soil some boxes, &c. paper, &c. &c.
 but he was not sure.

1st Napoleon, Fred. the Great & Dr Sam. Johnson were
 Frederick called his mother to account because, at the coronation of
 Queen of Prussia, she took a pinch in the midst of the solemn ceremony.



USE OF TOBACCO.





THE
LIBRARY OF THE
MUSEUM OF NATURAL HISTORY
NEW YORK

THE
USE OF TOBACCO,
AND
THE EVILS,
PHYSICAL, MENTAL, MORAL, AND SOCIAL,
RESULTING THEREFROM.

BY

JOHN H. GRISCOM, M. D.,

PRESIDENT OF THE NEW YORK ASSOCIATION FOR THE ADVANCEMENT
OF SCIENCE AND ART, AND TWENTY-THREE YEARS ATTEND-
ING PHYSICIAN OF THE NEW YORK HOSPITAL.

G. P. PUTNAM & SON,
661 BROADWAY.
1868.

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THE USE OF TOBACCO

AND

ITS EVILS.

THE effects of Tobacco upon the physiological organs and functions are as clearly manifest and understood as those of any other medicinal substance. It has long been included as an article of the *Materia Medica*, and is as well known to possess properties available for the treatment of certain diseases, as is Opium, Ipecacuanha, Digitalis, Belladonna, Camphor, or any other.

Like most other medicinal vegetables, its peculiar powers are dependent upon a special ingredient, which is capable of being extracted in a separate and distinct form, and which, in its natural state, is distributed through the whole structure of the plant. This ingredient is in the form of a Volatile Oil, obtainable by distillation at a high temperature, and in which the peculiar properties

of the plant are nearly all concentrated. It is known by the name of *Nicotine*, and is remarkable for an unusual combination of properties. In its separate and pure form, it has been demonstrated to be a *virulent poison*, when administered internally, acting as rapidly as Prussic acid or strychnine. A single drop of the oil injected into the body of a cat by Sir Benjamin Brodie, caused its death in five minutes; and double that quantity administered in the same manner to a dog was followed by the same result. An instance occurred in Brussels, in 1846, of a homicide produced in a few minutes by a small quantity of nicotine being forced into the mouth of the victim.*

A single drop applied to the tongue of a cat will cause convulsions, and in two minutes, death. More recently, a simple decoction of 12 grains of the plant itself, in six ounces of water, used as an enema, proved fatal to a human adult (Brit. and Foreign Med. Review, Vol. XII., p. 562). Sir Astley Cooper and Sir Charles Bell have also related cases of mortality resulting from the same cause.

Another illustration of the poisonous effects of

* It was proved that the criminal, known as Count Bocarmé, had prepared a small quantity of the oil by the distillation of tobacco, and forced it into the mouth of his brother-in-law, 30 years old, causing his death in a few minutes.

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of the plant known by the name of *for an unusual* separate and to be a *virtually*, acting as a *poison*. A single body of a cat caused death in five minutes after administration followed by a similar case in Brussels a few minutes after being forced into the mouth.

A single grain of the cause could not be proved. More recent cases of the plant used as an enema, and a Foreign Physician, Dr. J. C. C. Coc, has reported several cases of the same cause.

Another

It is remarkable that in its monstrosity it is caused internally by strychnine. It is caused by a small quantity of a dog was killed by the occurrence of a dog being

of a cat will cause death. A single grain of the plant used as an enema (Brit. and Foreign). Sir Astley Cooper also related a case of the same cause.

Its effects of

* It was proved that the criminal, known as Count Bocarmé, had prepared a small quantity of the oil by the distillation of tobacco, and forced it into the mouth of his brother-in-law, 30 years old, causing his death in a few minutes.

the plant itself very recently occurred in Staffordshire, England. A coroner's inquest was held on the body of a respectable grocer, aged 29, who had been drinking, and put into his mouth the greater portion of half an ounce of tobacco. He would not remove it from his mouth, and he became insensible, falling suddenly, and apparently swallowing a portion of the tobacco. He died in three days, and the verdict was according to this evidence.

Another demonstration of its fatal influence has very recently occurred in Ohio, reported by Dr. W. J. Tyrell. He was called to see a sprightly little girl who, three weeks previously, had her upper lip burned and bruised by falling upon a cooking stove. On the day before his visit she had been as well as usual all the forenoon, but in the afternoon her mother had decided to heal the sore; for which purpose she emptied the ashes from her pipe, then with her finger wiped the oil from the bowl, and applied it to the lip. The effect was violent convulsions, resulting in death within twenty-four hours.

Like all other substances possessed of these active properties in their pure form, this ingredient, when applied to the animal structure in its diluted form, by smoking and chewing tobacco, exhibits

its influence in various other modes. Thus, it sometimes acts as a *sedative*, a *narcotic*, an *emetic* and a *diuretic*. In addition to these, when tobacco is snuffed up the nostrils, it excites violent sneezing and copious secretion of mucus; when chewed, it irritates the lining membrane of the mouth, and increases the flow of saliva; and when used as an injection, it acts as a *cathartic*.

But its most powerful effects are upon the nervous system, and the mental faculties. In very moderate quantities, it sometimes quiets restlessness, and produces a state of general languor; but when extensively used it often produces confusion of the head, dizziness, stupor, faintness, nausea and vomiting, and great debility of the circulation, frequently resulting in alarming and sometimes fatal prostration. Coldness of the skin, and occasional convulsions are produced by its long continued and excessive use in the form of smoking and chewing.

The action of the heart is affected by it directly through the nervous system. Other functions also, especially those of digestion, are enfeebled by its abundant use, thereby preventing nutrition and producing emaciation and general debility, and, as a secondary consequence, impairing the tone of all the other functions and diminishing the growth

and development of the entire body, and also of the mental powers.

The fact that it is employed for the medicinal treatment of certain symptoms, especially those of the nervous system, is sufficient evidence of the properties above mentioned, while the peculiar and powerful character of its action upon the various functions of the body, prove indisputably that tobacco is solely a medicinal substance, and that its use in health must necessarily impair the integrity and soundness of these same functions, which are the most important of all. Its use is to be regarded, therefore, in a similar light as that of opium, the value of which as a medicine is very great, when judiciously administered, but when swallowed in a state of health, as is practised by the class known as "Opium Eaters," its effects are invariably injurious and frequently fatal.

Its most direct and manifest effect when first applied to the animal system, in almost any form, is that of an *emetic*. In illustration of this property the writer hereof well remembers the results upon his person. When about ten years of age, he was induced by a school mate one morning after breakfast, and before school time, to smoke a mild segar. A few puffs, very much to his surprise, sufficed to cause a total loss of the meal taken a short time

previously, and kept him in a state of nausea during all the morning, rendering him incompetent to maintain his position in the school classes.

It is sometimes employed for the same purpose in medical treatment, but very rarely, because of the excessive prostration it produces, this effect being more marked than by the use of any other emetic, not even excepting Ipecac or Tartar Emetic. This same exhausting influence upon the nervous system, and upon the circulation of the blood, is observable in many habituated to it, even when its emetic power is not manifested.

Its *narcotic* property produces a depressing and sedative effect, which, when not needed for the relief of suffering, is more or less exhaustive of the nervous functions, and hence depresses nearly all the other functions, especially the digestive, circulating and muscular powers, which depend upon the integrity and capacity of the nervous system for their full and healthful operations.

From several distinguished medical authorities, illustrations will now be quoted of the evil influences of tobacco manifested by other striking effects.

Mons. Decaisne, in a communication to the French Academy of Sciences, exhibits another clause in the heavy bill of indictment against its

use. In the course of three years he met, among 88 inveterate smokers, 21 instances of marked intermission of the pulse, occurring in men from 27 to 42 years of age, which could not be explained by any organic lesion of the heart, thus proving it to be caused by disturbance of the nerves which control that organ. In nine of these cases, when the use of tobacco was abandoned, the normal action of the circulation was restored. The condition of the heart in these cases he terms "Narcotism,"* and is characterized by intermission of the movements of that organ, and of the pulsation of the arteries. A suspension of the practice of smoking is sufficient in some cases to cause an entire disappearance of this irregularity.

The opinion has long been entertained that tobacco is a frequent cause of loss of sight. The diseased condition of the eyes produced by it is a species of amaurosis (paralysis of the optic nerve), commencing with symptoms of functional brain disease, and alterations of the supply of blood to the optic nerve and retina. These affections occur in large excess in adult males, being very infrequent in women, and a large portion of those who suffer from it have been smokers.

* A species of numbness characterized by vertigo, and a degree of intoxication or apoplexy, accompanied with convulsive motions.

Mons. Viardin has reported three cases of the same disease caused by smoking. In the treatment of these cases, the quantity of tobacco smoked was reduced under his direction, and the sight was restored in the course of a few weeks.

At a meeting of the Harveian Society of London in November, 1864, Dr. Drysdale stated that he had recently remarked cases of *jaundice* in healthy young men, evidently produced by great smoking, such as three quarters of an ounce to an ounce of tobacco a day. Profuse smoking, he believed, tended to lower all the appetites, whether for exercise, food, or sex.

Mr. Curgenvven observed that *dyspepsia* and *palpitation of the heart* were among the most common consequences of excessive smoking. A gentleman from Havana, a patient of his, an excessive smoker, who rarely had a segar out of his mouth, had, one day, an attack of *syncope* (sudden and complete loss of sensation and motion), which he had attributed to a habit during many years of smoking on an empty stomach. A medical friend of his had suffered greatly from nervousness and dyspepsia, owing to excessive smoking. He left off the habit and recovered.

Mr. Weeden Cooke observed that tobacco smoking affected different persons very differently.

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Many gentlemen, from 30 to 35 years old, came to him, complaining of *impotence*; and he had generally found them profuse smokers. He supposed tobacco, like opium, was a useful drug in some cases, but, like opium, liable to injury when taken in excess.

The President said excessive smoking caused nervous diseases, conjoined with dyspepsia and *deranged liver*; DILATED PUPIL and AMAUROSIS were caused, he believed, by it, and in a case he had lately sent to an eminent oculist, the ophthalmoscope had shown that gentleman that the disease was caused by the habit.

Dr. Royston mentioned the case of a ship chandler in Liverpool, an excessive smoker, who had acute *inflammation of the liver*, after an excessive bout of smoking; also the case of a clerk on the Great Western Railway, who seldom had a pipe out of his mouth, and who had fallen into a fit of intense prostration and *died*, Dr. Royston believed in consequence of his profuse indulgence in smoking. *No post mortem lesions were found.*

The truthfulness of these opinions was strikingly confirmed during the preparation of this essay, by the observation of the writer, in the case of a man 52 years of age, suffering severely from dyspepsia, dysentery, nervous irritation and other painful

symptoms, who applied for relief therefrom by medical treatment. The cause of the troubles was clearly the habit of pipe-smoking to the extent of 7 to 10 times a day, using a quarter of a pound of tobacco each week. He had continued the practice sixteen years, and for several years past he has complained of serious disturbances of the nervous system, amounting, on one occasion, to slight convulsions, which, without prompt treatment would very likely have proved fatal.

His appetite had been so much reduced by the habit, that on many occasions when called to his meals, he preferred to go into the open air to smoke his pipe, and thus greatly reduced his strength. Upon being instructed as to the real cause of his physical troubles, and the danger to which his mental powers were subject, he immediately abandoned the practice and rapidly recovered his health.

All the friends of our Republic must feel grieved at the noted illustration of the influence of tobacco smoking in producing dyspepsia, manifested in the case of one of the most popular Heroes of the Union Army, the responsibility of whose present position requires the most vigorous health of all his physical and mental faculties, but which, from his profuse indulgence in the habit, are likely at any

moment to be seriously impaired, to the injury of the Government, as well as of himself.

It is specially desirable by the whole country that in his particular case the favor of total abstinence from this useless and dangerous practice may be speedily GRANT-ED.

CANCER.

Cancer of the lips frequently occurs among smokers, especially on the side on which the segar or pipe is held. From this form of cancer women are almost entirely exempt.

The predominance of cancer observed in women, of almost all the organs, ceases, also, with respect to the stomach, which is found to be more frequent in men, in the proportion of 53 per cent. The danger from chewing tobacco in this relation is very great, especially as tobacco containing 6 per cent. of nicotine is usually employed, and that during fasting. Organic affections of the stomach are of great frequency among sailors who indulge in this habit.

DISEASES OF TEETH AND JAW-BONE.

Smoking has long been a popular remedy for toothache; the sailor's quid has a special reputation for this purpose. We now refer to the case

of an unfortunate patient, whose application of the remedy in a concentrated form set up inflammatory action which destroyed a large portion of his jaw. Dr. Paget, his medical adviser, states that to relieve himself from the suffering produced by a decayed tooth, he introduced into the hollow of it some of the oil of tobacco which had accumulated in the stem of his pipe. Violent inflammation of the periosteum (the membrane covering the bone) was set up, ending in death of the osseous tissue. Just under his left lower jaw the skin was ulcerated, and there was a cavity communicating with the dead bone. Dr. Paget removed several of the teeth, and then, without making any incision, contrived with a strong forceps to remove several portions of the dead bone representing a portion of the base, the angle, and a large part above the angle of the left lower jaw.

This case well illustrates a source of danger not generally recognized. Foul pipes and decayed teeth are very common. Pipe smokers are frequently disgusted by sucking into their mouths a few drops of the highly pungent and nauseous product of the combustion of tobacco.

The following testimonial of a very distin-

guished hygienist can doubtless be confirmed by thousands of tobacco smokers.

Extract of a letter from Dr. Dio Lewis:

"LEXINGTON, May 13, 1867.

"In my own mouth I have the most unmistakable proof of the mischievous influence of tobacco smoke, having while I was in college been a great smoker, and spoiled two teeth above and two below; parts that were directly affected by inhalation of the smoke."

In addition to its effects upon the teeth, the tip of the tongue which also receives the deleterious fluid, is often blistered by it.

There is good reason for the belief that many cases of disease of the jaw-bone, whose causes have been obscure, were the result of poisoning of the teeth by this liquid, and the possibility of this, as a source of disease, should be constantly borne in mind.

The manner in which this destruction of the teeth is effected is by the Nicotine contained in the smoke and in the tobacco itself being absorbed by the saliva and by the particles of food remaining in the mouth after eating; it is thus brought in direct contact with the teeth, destroying the enamel first, and afterwards rotting their whole structure. It is not unreasonable to suppose that

a considerable portion of the services now required of dentists in this and other countries, which have enormously increased of late years, is derived from the tooth-rotting effects of tobacco smoking and chewing.

The peculiarly disgusting odor of the breath of every smoker and chewer, for a long time after the practice, is positive proof of the retention in the mouth of the poisonous essence to which the teeth-destroying effects are attributable. The same effluvia is also carried into the lungs by inhalation, thus showing how the general influences hereafter described are produced.

Another popular idea of the value of tobacco which has largely promoted its use, is its supposed property of *preventing malarious and other fevers*. There has never been offered any scientifically based reason for this opinion, though it has largely prevailed among smokers, &c. The following statement given by an experienced physician, Dr. Samuel E. Wills, most decidedly demonstrates the absurdity of this notion.

“CECILTON, MARYLAND, Sep. 23, 1867.

“*To the Editor of the Med. and Surg. Reporter :*

“In reply to Dr. W. S. King's inquiry in the
“Reporter of the 14th inst, relative to the *pro-*

"phylactic virtues of tobacco in malarious fevers, "I beg leave to say,—my observations for the last "25 years as a practitioner of medicine, part of the "time in the Chickahominy region of Virginia, "and the last 20 years on the Eastern shore of "Maryland, do not corroborate the theory that "tobacco possesses any such property. Habitual "chewers and smokers, both women and men, "have been as frequently numbered among my "intermittent cases, as those who never use "tobacco."

In further confirmation of this view, Dr. John Wright, of Clinton, Illinois, writes that with good opportunities of observation, he has never seen a single case where he thought tobacco acted as a prophylactic in malarious diseases. He thinks that, if it had any such claims, they would have been put forward by those who are seeking excuses to justify them in the use of this filthy weed.

Furthermore, he says that even if it should be proven to be a prophylactic, he would rather have the ague than use it, especially while we have such a reliable prophylactic as quinine is known to be, when properly used.

James M. Clairborne, M. D., of Stewartsville, Indiana, in a letter to the same medical Journal,

dated November 8th, 1867, writes to the same effect as follows:

"As my practice is principally in the malarial region of the Wabash and Black rivers, I have good opportunities for observing the prophylactic effects of medicines, &c., and I have utterly failed to observe any prophylactic properties of Tobacco in malarial diseases; but, on the other hand, see numerous cases of malarial disease in persons who are habitual users of the 'filthy weed.' And like Dr. Wright, of Illinois, in view of the prophylactic property of Quinia in this disease, I consider the habitual and excessive use of tobacco the greater affliction of the two."

POISONING BY TOBACCO JUICE.

Dr. M. A. Marchant relates the following case. A smoker, in drawing air strongly through an obstructed pipe, in order to make it more permeable, took it into his mouth and involuntarily swallowed a dislodged plug of inspissated tobacco juice. In a short time his head became heavy, his thoughts confused, his speech indistinct, he had noises in the ears, a disagreeable feeling in the epigastrium (pit of the stomach), and dryness of the throat.

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TOBACCO IN CERTAIN NERVE-DISEASES.—The
Doctor says that M. Tarnisier, in a recent French
journal, states that, out of fifty-nine grave affections
of the nerve-centres observed from 1860 to 1869
among men, forty occurred in smokers. In fifteen
cases of hemiplegia, nine abused tobacco, and two
used it moderately ; four did not smoke. Of
eighteen cases of paraplegia, five were great smok-
ers, three moderate smokers, and ten abstained
from tobacco. Out of twenty cases of locomotor
ataxia, fourteen were great smokers, five moderate,
and one abstainer.

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evidence ; and this increase is found to be in men,
almost entirely made up of cases of *progressive
paralysis* (now forming more than 60 per cent. of
the total in France), and whenever, in the asylums,
the history of such cases has been investigated,
their dependence on the abuse of tobacco has been
rendered obvious. In 1856, a committee from the
Queen's College of Physicians in London, in a re-
port on the cause of death by apoplexy, within
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1. All bedding and personal clothing infected with the small-pox contagion, which can, without injury, must be washed in boiling water.

2. Infected feather-beds, pillows, and hair mattresses must have contents taken out and thoroughly fumigated, and ticks washed in boiling water.

3. Infected straw and excelsior mattresses must have contents removed and buried, and ticks washed in boiling water.

4. Infected blankets, sheets, and pillow-cases, and all articles in contact with, or used by the patient, have been washed in boiling water.

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POISONING BY TOBACCO JUICE.

Dr. M. A. Marchant relates the following case. A smoker, in drawing air strongly through an obstructed pipe, in order to make it more permeable, took it into his mouth and involuntarily swallowed a dislodged plug of inspissated tobacco juice. In a short time his head became heavy, his thoughts confused, his speech indistinct, he had noises in the ears, a disagreeable feeling in the epigastrium (pit of the stomach), and dryness of the throat.

Believing that the open air would remove these

feelings, the patient went out; but the headache and giddiness increased, and he at last fell down insensible, in which condition he was, after some time, found by a passenger and carried into the house. Copious and repeated vomiting then set in; consciousness returned, but the patient fell into a restless, somnolent state. He had severe headache, *malaise*, and faintness, during the whole of the next day. The spontaneous recovery may be attributed either to the small amount of nicotine contained in the plug, or to the imperfect absorption of the poison contained in the hardened plug.

PARALYSIS.

That affections of the nervous system have enormously increased in other countries, as well as in this, especially in France, there is positive evidence; and this increase is found to be in men, almost entirely made up of cases of *progressive paralysis* (now forming more than 60 per cent. of the total in France), and whenever, in the asylums, the history of such cases has been investigated, their dependence on the abuse of tobacco has been rendered obvious. In 1856, a committee from the Queen's College of Physicians in London, in a report on the cause of death by apoplexy, within the city, stated that the bills of mortality from this

disease were very large, and that 7 in 9 cases of paralysis and apoplexy were caused by the use of tobacco; of this number more than one half were caused by snuffing. In confirmation of this is the rarity with which this form of the disease is met with in female lunatics.

Mr. Jolly's investigations have induced him to come to the conclusion that this abuse of tobacco is far more operative in the induction of this form of paralysis than is the abuse of alcohol. Among other facts tending to prove this, he adduces this one: in certain provinces in France—as Saintaigne, Limousin, Bretagne, &c., in which there is but little smoking, and an enormous consumption of brandy, progressive paralysis is well nigh unknown.

Another effect of the protracted use of Tobacco, either by smoking, chewing or snuffing, is the impairment of the sensibilities of the nerves of sense, with which the smoke, or the tobacco itself, comes in immediate contact. These are the senses of taste and smell, the sense of sight having already been shown to be often seriously impaired by it. When snuff is first drawn into the nostrils, it excites violent sneezing and copious discharges of mucus, which continues a considerable time, but when it has been practised so long that these results are diminished, then it is almost invariably

certain that the delicate sensibility of the olfactory nerve is greatly impaired, and often destroyed; and thus, one of the protective powers furnished by nature against injurious odors is totally lost, rendering many external influences inappreciable and dangerous.

The same remark is applicable to the sense of taste, from the practice of smoking and chewing rendering the gustatory nerve insensible.

In a person of good constitution, the suspension of the habit may restore these senses, as has often been noticed; but when continued, it is very plain that the risk of injury to the health from external sources is greatly increased, as these senses act as sentinels, guarding against the approach of inimical influences.

Dr. Cullen, one of the most able and distinguished physicians of Great Britain during the 18th century, mentions the case of a lady who had been accustomed for more than twenty years to take snuff at all times of the day; she found, at length, that indulging much in the use of it took away her appetite, and in process of time that a single pinch taken any time before dinner, palled her appetite for that meal. But when she abstained from the use of it, her appetite returned. There can be no reasonable doubt that were all snuff takers willing

to state their experience in this respect, immense numbers of similar character would be found to exist, and from excess of smoking, this and other effects referred to would doubtless be discovered.

One of the many temptations for indulgence in tobacco smoking is the opinion expressed by some professional men that the moderate use of it after meals tends to promote digestion. The reason given for this is that it excites a large flow of saliva, and thereby sympathetically increases the secretion of gastric juice. Admitting this to be true for argument sake, the idea is insufficient to justify indulgence in the habit, for the following reasons: *First*, because of the ultimate dangers threatened by it, and, *second*, because there are many other equally good promoters of digestion, which may be employed with perfect safety, and without any evil influences upon either the physical or mental powers. *Third*, a still more potent objection is one heretofore mentioned, viz.: that its *frequent* practice, which is an almost certain result, is very apt to produce dyspepsia of the most serious character, besides the numerous other evils heretofore, and hereafter to be, described.

Another serious disorder has also been noticed, as derived from the practice of smoking, viz.:

Deafness. M. Triquet states,* that, in both smokers and drinkers, an insidious and obstinate form of *Otitis* (inflammation of the ear) frequently becomes developed.

There is a kind of numbness or torpor of the ear, with a sense of cold, but rarely any pain, and no wax in the orifice. Frequently both ears are affected, but one has always commenced being so before, and is more deaf than the other. The deafness, without being very troublesome at first, rapidly increases. Noises in the ears almost always exist at an early period, and it is of importance to notice that they assume a hissing sound, eventuating in a paralytic condition of the auditory nerve, whereby the sense of hearing is more or less impaired and often permanently lost. Those patients alone are susceptible of cure who consent to leave off the bad habit which produces the derangement.

Numerous other instances might be quoted, illustrative of the injurious and often fatal properties, but the preceding facts demonstrate sufficiently the poisonous influence of tobacco upon the physical functions, and the published cases are but a small fraction of what must have occurred; it is

* Annales d'Oculistique. Amer. Jour. Med. Science, Oct. 1865.

therefore very plain that the sufferers from the indulgence in the pernicious practice of tobacco chewing and smoking, are far more numerous than is known to the public, and there can be no reasonable doubt that many lives are lost thereby, which are attributed either to other and erroneous causes, or included under the common verdict "the visitation of Providence," inasmuch as no organic lesions are discoverable.

There is yet another branch of this subject, compared with which the physical effects heretofore alluded to are of comparatively trifling importance, viz.: *the disturbance and impairment of the mental faculties*. The proofs of this are as plain as those already given of its physical effects, demonstrations of which will now be given, showing that Nicotine, like Opium and Alcohol, has a very marked and peculiar influence in that direction.

Among the many known cases of its influence upon the intellectual powers, the following interesting facts are reported by M. Bertillon, in the *Union Medicale*, derived from an investigation made at the French Polytechnic School in 1855-56. He investigated 160 of the pupils who had undergone their examination; and what influence the fact of their having been smokers had upon the

Juvenile Smoking.—Whatever opinions may be entertained as to the effects of moderate tobacco-smoking on the adult, there can be none as to its deleterious influence on the boy. The molecular changes coincident with development of tissue are interfered with, slowed, if not arrested by tobacco. Take the blood-corpuscles, for example, and see how the narcotic affects them. According to German physiologists, they lose their round shape and become oval and irregular at their edges; while, instead of mutually attracting each other, and running together in *rouleaux*—a good sign—they cohere loosely, or lie scattered on the field of the microscope—a bad one. The physical effects are paralleled by the psychical ones. M. Bertillon found that, of the pupils attending the Polytechnic at Paris, 102 smoked, while 58 did not. Arranging the two categories in the order of merit, according to the results of the examinations, he found the non-smokers held, in every grade, the higher rank; and that the smokers, as compared with the non-smokers, deteriorated from their entering to their leaving the school. Facts like these induced the Minister of Public Instruction, in 1861, to issue to the directors of colleges and schools throughout the empire a circular forbidding tobacco to the students, on the ground "that the physical as well as the intellectual development of many youths has been checked by its use." In Germany, where at so many schools the Bursch's ideal may be summed up in Goethe's lines—

"Ein starkes Bier, ein reizender Taback
Und eine Magd im Puss, nun das ist mein
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the premature smoking of tobacco would, but for the superior stamina of the race,

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J. T., stout male, was admitted into the Nottingham General Hospital with a compound comminuted fracture of the left leg. Amputation was resorted to; he did not appear to be suffering from shock; and the quantity of blood lost, although large, was not so great as might have been expected from the nature of the injury. About three drachms of chloroform were administered. Face became livid; the tongue was thrust between the teeth, and respiration ceased, but was immediately resumed on removal of the tongue by forceps. He continued to respire with ease, and became partially conscious. A few more chloroform were inhaled. Ten minutes later the respirations were more shallow and less frequent; suddenly face became livid, teeth firmly fixed, and respiration ceased entirely. All efforts at resuscitation were fruitless.

Heart was found to be pale and empty; mitral valve was slightly thickened, and there was atheromatous deposit in the aorta. The stomach was half full of partially digested food; the pharynx contained some of this.

Mr. WILLIAM BIRD, of York, records in the same journal another case. Mrs. C., aged 57, was operated upon for tumour of head. Less than half a drachm of chloroform was administered on a sponge. A second half-drachm was added, and, within a minute after, the pulse suddenly stopped, the breathing then ceased, and the countenance became livid. Efforts at resuscitation were of no avail.

Death from Bichloride of Methylene.—A case of death after inhalation of this substance occurred at Middlesex Hospital on Oct. 9. The patient, a man aged 48, was admitted for a deep abscess in the buttock, discharging a short way within the

prove not less disastrous. As it is, tobacco amaurosis is an ophthalmic affection quite recognized by German physicians as having its origin at school and college. Amongst ourselves juvenile smoking is getting more and more common, with the result of impaired eyesight, thinning of the hair, and other symptoms of excessive draughts on the trophic nerve-centres. — *Lancet*, Oct. 5, 1872.

Of these pupils of the classification of the entrance examinations, that fourth of the series three-fifths were termed smokers at their entrance. In the larger the case of the 60 pupils who were not smokers, their rank of 71 on entrance (already 23 ahead of the smokers), rose to 67.7—being, as the result of nine months' work in common, 30 in advance of the smokers. This result of the inquiry, as regards these limited numbers, was conformable to the prior experience of the school.

In this case, the pupils being chiefly a younger class of smokers, they probably indulged in the practice to an extent comparatively moderate, and yet the influence of it upon the intellectual faculties, as compared with those of the same age and class who refrained from the vicious habit, is very plain.

A further and more serious result of the free use of tobacco now to be mentioned, is the *total* impairment of the intellectual faculties, in other

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acknowledges the hearty support given to "RANKING'S HALF-YEARLY ABSTRACT OF THE MEDICAL SCIENCES," which is the enterprise a permanent one. The profession for the year 1873 on the

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results. As large a proportion as 102 of these pupils were smokers. It was found, in the classification by merit which followed the examinations, that while in the highest series a third or fourth of the pupils were smokers, in the lower series three-fourths, and in the lowest series four-fifths were smokers. Again, while among 66 confirmed smokers, their average rank of 94.5 on their entrance into the school had sunk to 98.3 (the larger the number the lower the rank), in the case of the 60 pupils who were not smokers, their rank of 71 on entrance (already 23 ahead of the smokers), rose to 67.7—being, as the result of nine months' work in common, 30 in advance of the smokers. This result of the inquiry, as regards these limited numbers, was conformable to the prior experience of the school.

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A further and more serious result of the free use of tobacco now to be mentioned, is the *total* impairment of the intellectual faculties, in other

words, the production of *Insanity*. In the reports of the Lunatic Asylums of this and other countries, this is very frequently included in the list of causes of this sad condition, and the evidences of its influence upon the mental powers are so direct and clear as to be unmistakable. The great increase in the numbers of lunatics during recent years, in various civilized countries, presents a marked parallel with the increased use of this poisonous substance.

For example, in his report for 1866, Dr. Kirkbride, Superintendent of the Pennsylvania Hospital for the Insane, states:—"6 cases were clearly attributable to the uses of tobacco. The pernicious effects thereof are much greater than is generally supposed. In certain temperaments it produces symptoms of an alarming character, and not unfrequently is the cause of obscure and obstinate ailments, connected especially with the gastric and nervous systems. This has often been seen here very strikingly, when patients, after being without a supply for a long time, have again commenced its use.

"Even the most obtuse of those about the patients could not fail in many cases to observe its effects. The use of tobacco and the use of alcoholic stimulants seem to have at least one

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A very illustrative of the relations of Tobacco and insanity has recently been brought to light in France by a paper laid before the Academy of Sciences, viz.: that insanity increases in proportion to the amount of tobacco used. Thus it is said that between 1812 and 1832 (20 years) the tax on tobacco produced 28,000,000 of francs, and the lunatic asylums of the country contained 8,000 patients. Since that time, the tobacco revenue has reached the sum of 180,000,000 of francs, and the number of lunatic and paralytic patients has increased to 44,000.

This increase of revenue is about 650 per cent. and the increase of the disease 550 per cent., very

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“somewhat similar effect on those who have long
“been addicted to them, and that is an inability
“to perceive any injurious consequences in their
“own cases, however obvious they may be to
“most others. The effects of tobacco on most of
“the inmates of a hospital for the insane are such,
“that, on hygienic grounds, even if there were no
“others, its use should be entirely interdicted in
“all such institutions. I have never seen the
“slightest injury result from the immediate and
“total breaking off of the habit of using tobacco,
“and the experience of this hospital is a large one
“in this particular.”

A very important fact illustrative of the relations of Tobacco and Insanity has recently been brought to light in France by a paper laid before the Academy of Sciences, viz.: that insanity increases in proportion to the amount of tobacco used. Thus it is said that between 1812 and 1832 (20 years) the tax on tobacco produced 28,000,000 of francs, and the lunatic asylums of the country contained 8,000 patients. Since that time, the tobacco revenue has reached the sum of 180,000,000 of francs, and the number of lunatic and paralytic patients has increased to 44,000.

This increase of revenue is about 650 per cent. and the increase of the disease 550 per cent., very

nearly the same proportions. These facts are certainly well worth the consideration of every human being, especially of those with whom the pernicious practice has already become a fixed habit, or a second nature.

Let all reflect, ere it be too late, on the frightful warning contained in the above statistics. The last words of the individual who reported them, should be deeply impressed upon every mind, especially of the young. He said, "Immoderate use of tobacco, and more especially of the pipe, produces a weakness of the brain, and of the spinal marrow, which causes madness."

The following interesting story, illustrative and confirmatory of the views of the officials just quoted, is extracted from a New York paper of November 15, 1867.

"**LOVE AND LUNACY.** BROUGHT TO AN ASYLUM BY CROSSED LOVE AND EXCESSIVE TOBACCO CHEWING.—Some 12 months ago a young man, who was then employed in the Nashville and Decatur Railroad car shops, a steady, industrious mechanic, formed the acquaintance of a lady about 15 years of age. An attachment speedily sprang up between the two, which resulted in an engagement.

"The first troubles arose from the objections urged by the parents of the young lady. The old

folks preferred another man. In anticipation of his marriage, however, the suitor had saved from his wages a considerable amount of money: He could now give the object of his affections a comfortable home, and saw no reason for waiting.

"About two weeks ago he asked that the wedding might take place at an early day, but his *fiancée* wished to defer the nuptials for two months, as at the expiration of that time she would be sixteen. This, with renewed opposition from the parents, seems to have weighed heavily upon his mind. He was an inveterate chewer of tobacco, and had often consumed nearly half a pound per day. This habit had long been at work undermining his nervous system, and his sorrows made him all the more persistent in masticating the weed. His quid was his constant companion. The more he thought of his crossed love, the harder he chewed. There was no limit to his unnatural indulgence. Every sigh was suggestive of a fresh mouthful; every reminiscence of the dear one was followed by copious expectoration.

"The rest is soon told. About two weeks ago he began to exhibit unmistakable signs of lunacy, and is now under a physician's charge. His mental condition is directly attributed by the physicians to the excessive use of tobacco, aggravated by the

effects of disappointed love on a weakened intellect."

Having thus demonstrated the effects of tobacco upon both the physiological and intellectual faculties of the individuals using it, even in the very common form of smoking, and more especially of chewing it, the next point to be considered is the influence of the practice of smoking *upon others*. In the first place, the presence of smoke in the air, derived from the combustion of any vegetable substance whatever, is offensive to the eyes and nose of all who see or inhale it, and moreover it is injurious to the lungs and blood. The principle ingredient of the smoke of all combustible substances is *carbon*, from which it derives its dark color. It is often deposited in the form of soot, showing the great quantity of this material derived from ordinary fuel. But tobacco smoke is doubly offensive and injurious, in consequence of its containing nicotine (the poisonous oil of the plant) combined with the carbon. It is this which gives to tobacco smoke its peculiar odor, so offensive to many, and necessarily injurious to the health of every one who inhales it.

If every human being should understand and appreciate the true value of pure air when inhaled, and the injurious influence of any foreign sub

stance when absorbed into the blood through the lungs, the writer hereof cannot doubt that tobacco smoking would be totally discarded voluntarily, and perhaps legally. Under this view, it is plain that the practice referred to is a *nuisance* to all who refrain from it; and further still, the foul odor of the clothing, hair, and breath, produced by the absorption of the smoke, renders the person of the smoker also very offensive. No one who properly appreciates the value of social intercourse, and the propriety of keeping his person in a genteel and pleasant condition, can indulge in so foul and offensive a practice, and every one who does so, should be wholly excluded from society for both sanitary and social reasons.

When practised even in the public streets, in the open air, and especially in large halls where people congregate, and in cars and other travelling vehicles, particularly where ventilation is disregarded, the effects of the smoke is offensive and injurious to great numbers of people.

Under such circumstances, it is justly regarded as a *public nuisance*, and, as in all cases of like character, it should be liable to suppression and prevention by the proper authorities.

The placard frequently presented to our observation when passing through the streets of cities,

"*Commit no nuisance under penalty of the law,*" should be understood to be equally applicable to this foul and unnatural emanation, as it is to those which are the demands of nature, no more injurious, and less offensive. Especially on cars, in hotels, and all other places of public resort, should the restriction be rigidly enforced.

The *immoral influences* of this vile habit are sometimes as clearly manifest as are its physical, mental, and social evils. The irritability of the nervous system, and the depression of the mental powers produced by it, are very apt to result in diminished appreciation of, and indifference to, the moral obligations of the individual; in consequence whereof evil deeds and the neglect of intellectual and religious duties are very apt to occur.

One of the most common and serious effects is the demand for alcoholic drinks, to satisfy the extreme thirst, and obviate the prostration of the physical functions resulting from the high temperature and the narcotic influence of the burning weed.

There is no doubt that a large amount of the intemperance now so prevalent, is the immediate and direct effect of tobacco chewing and smoking, and no individual, however safe he may feel him-

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self against intemperance before yielding to the temptation of tobacco smoking, can rely upon himself to avoid it after considerable indulgence in the latter practice, as both his moral and intellectual sensibilities are almost certain to become impaired, which fact he cannot himself appreciate. It is therefore difficult and almost impossible for a confirmed lover of tobacco to avoid the terrible evils of intemperance.

Having thus demonstrated, by numerous verified facts, the very frequent and almost universal influences of this singular plant, upon the physical, intellectual, moral and social qualities of man, it now only remains to decide whether that being made in the image of God, and endowed with faculties superior to all other created beings, and alone possessed of the power to discriminate between right and wrong, is justifiable to the least extent in indulging in a habit which impairs those noble faculties thus bestowed upon him.

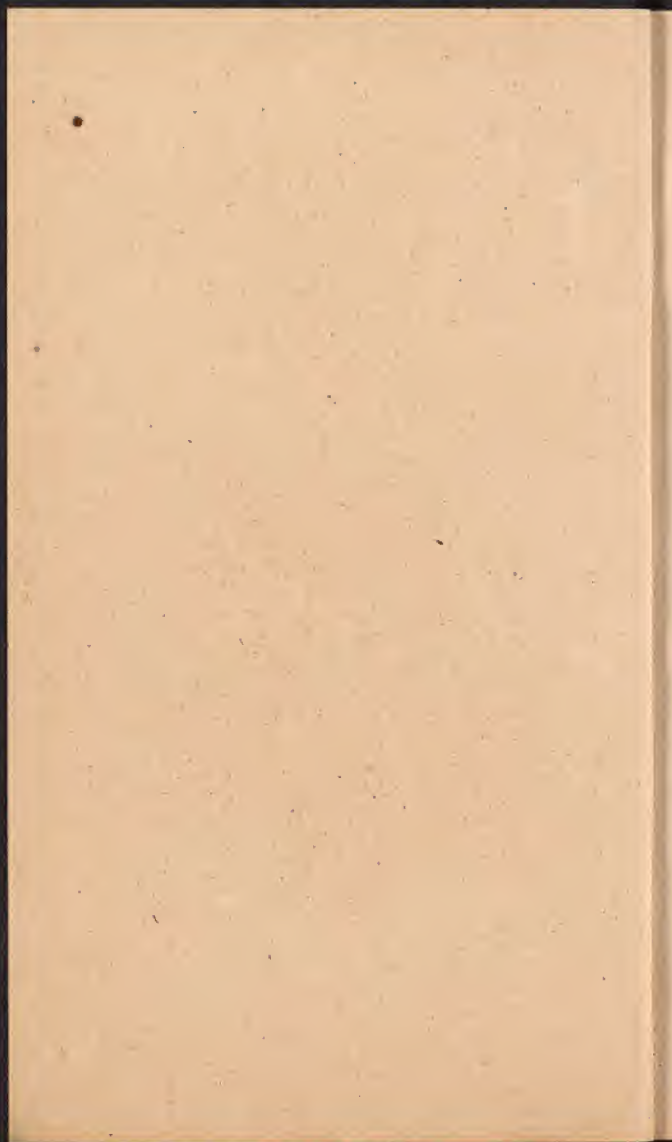
Every habitual tobacco chewer or smoker, when in good health, if able to understand, must admit the wickedness of opium-eating, because of its impairment of the noble faculties which distinguish him from the brute, and that death, when produced by it, which is sometimes the case, is correctly denominated *Suicide*.

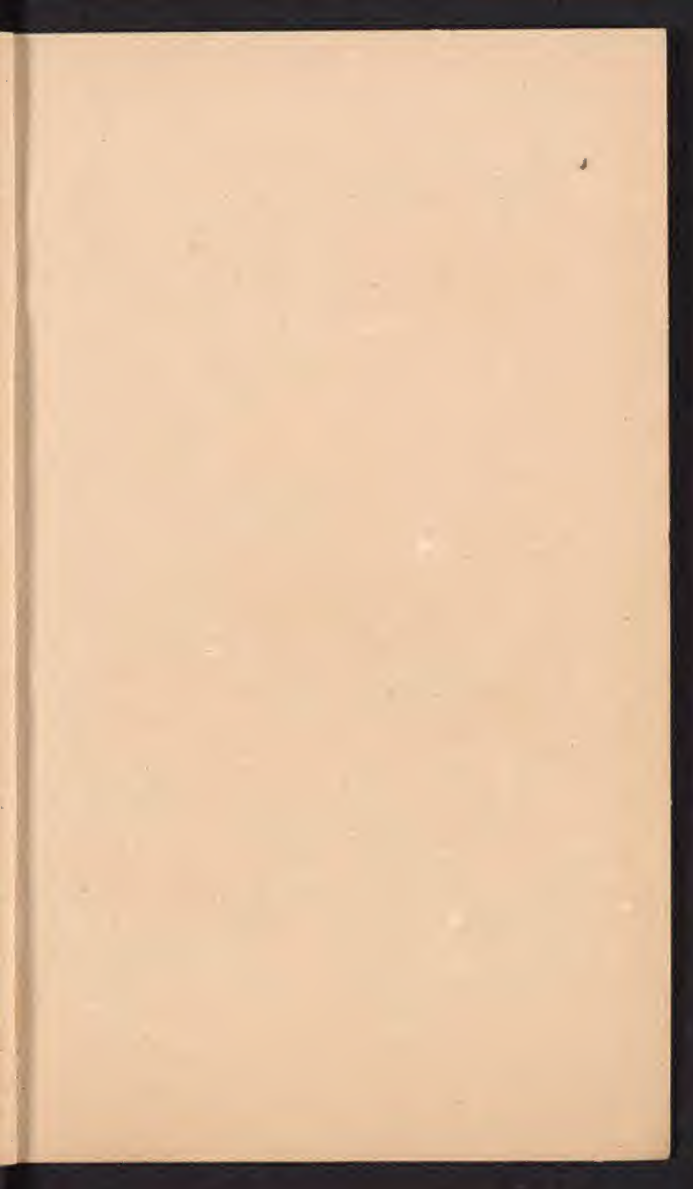
The evidence herein presented furnishes ample proof that very similar effects result from the use of Tobacco; wherefore, as the indulgers in this habit impair to a greater or less degree the physical and mental faculties which they are bound by every religious consideration to preserve and improve, they are liable to the same indictment as the Opium-Eater, and to the same ultimate penalty.

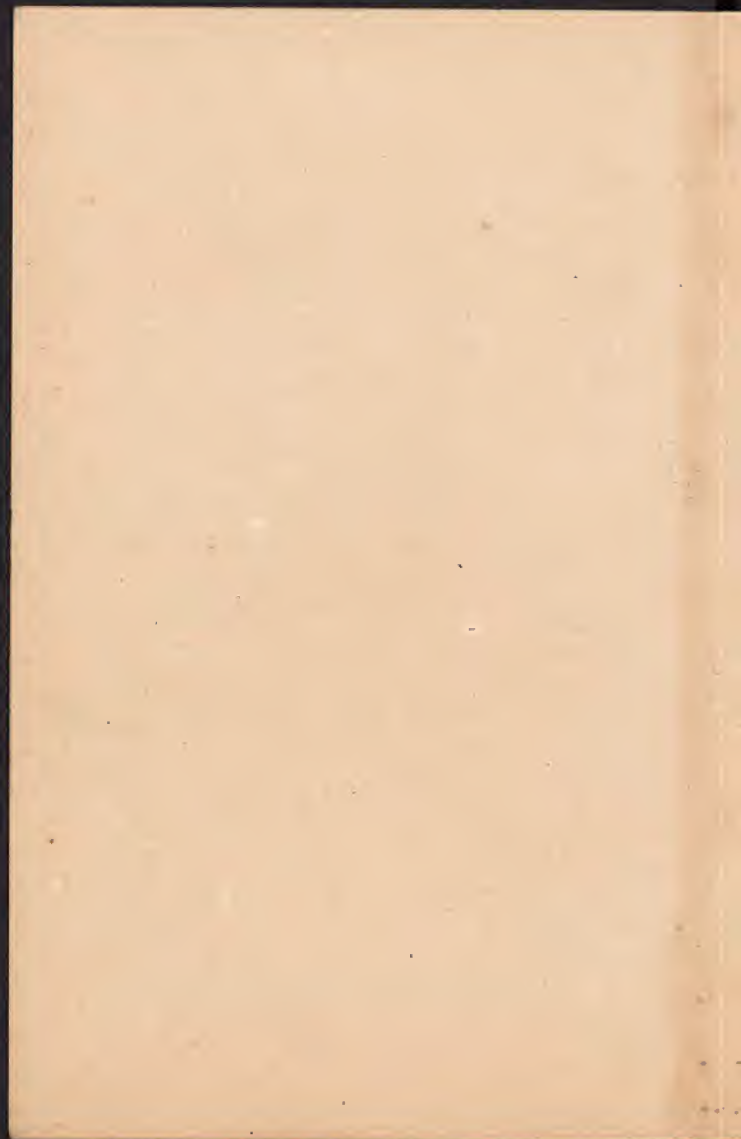
Finally, the injurious and often serious influences of tobacco upon the physical and mental faculties, are proven sufficient to convince any reasonable person that no indulger in the use of it can be safely relied upon for the performance of any engagement, requiring a perfectly sound and healthy body and mind. When a contract is being made by a tobacco smoker or chewer, he may be perfectly clear and strong in the qualities required, yet the continuance of the habit must render his capacity uncertain, for at any time the heart or brain may become involved in the influences of the poison, as in many previous instances. In the ordinary business relations of life, particularly those requiring special keenness of intellect, the filthy weed may at any time impose an injunction, and commit its unnatural

employer to the Hospital, the Asylum, or the Grave.

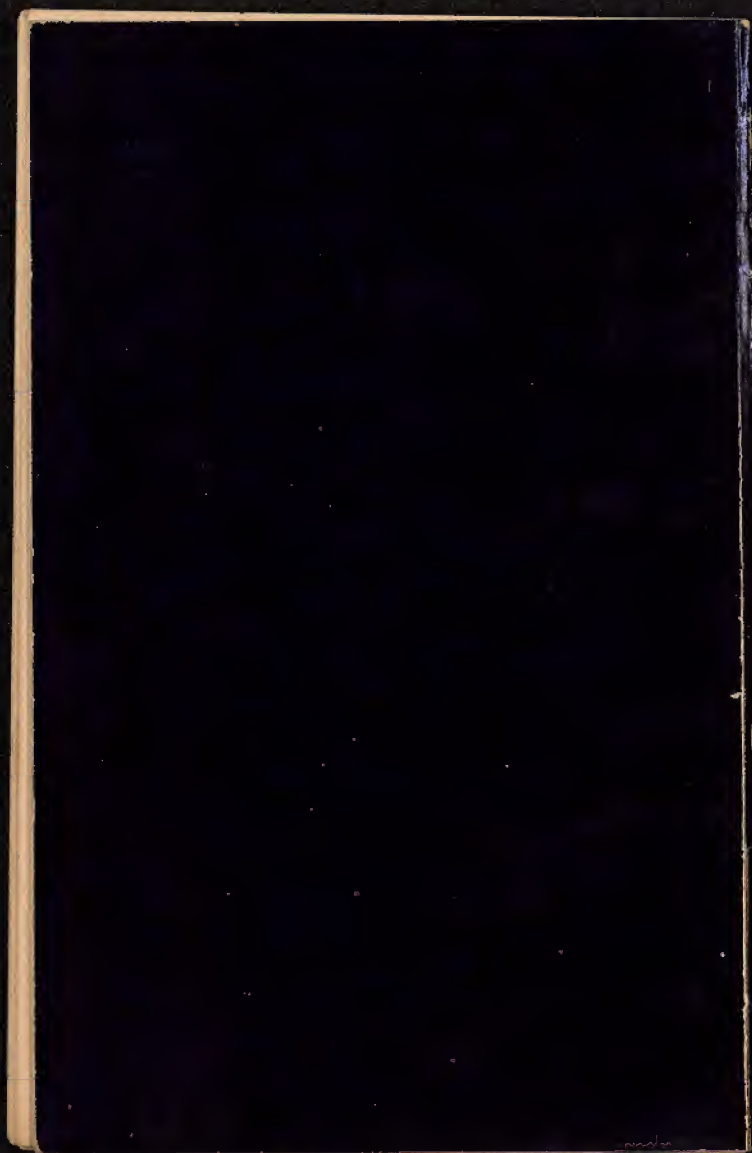
This same consideration is also clearly applicable to the business of Life Insurance.











THE BETEL NUT.—There is a fascination in betel nut more extraordinary than in a tobacco passion. The consumption of the latter in chewing alone, in the United States, is a modern phenomenon. An inveterate chewer may have moral resolution enough to break off the habit, though it rarely happens that an effort is made to do so, as an apology is found for continuing a practice that is positively destroying the foundations of health. Once addicted to chewing tobacco, to abandon it is an achievement few have the happiness to overcome, notwithstanding the melancholy mortality of men in the meridian of life who are constantly being destroyed by the subtle influence of that strange plant on the nervous system. Thus, sudden palsy of the heart, palsy of a limb, palsy of one-half the tongue, and even instantaneous death, are traceable by physicians to excessive use of tobacco.

Areca
vatecha

But the vice of betel nut chewing, however, is still more remarkable. When the habit is established, there seems no retreat. Each victim wears out his teeth, gums, digestion, and dies with an unsatisfied longing for another quid. Betel nut trees thrive in most parts of tropical India, the Indian Archipelago and the Philippine Islands. They grow up gracefully about thirty feet, rarely more than eight inches in diameter. ~~It is an areca~~ vatecha. Penang is the universal name of the nut in those places where it is produced, hence pulo penang means a betel nut island. At six years of age the tree commences bearing nuts the size of a small pullet's egg, of a bright yellow color, enclosed in a husk similar to the cocoanut; within is a spherical nut, very much like a nutmeg. Broken, a bit of it is wrapped up with a piece of unslaked lime in a peculiar leaf, the siri betel-piper, extensively cultivated for that purpose.

The gums and mucous membrane of the mouth are quickly stained a brick red, the teeth crumble to a level with the gums, and in that condition an inveterate betel chewer is wretched without a supply. There are large plantations of betel nut trees in Java to meet the demand for home consumption and distant provinces. To augment the pleasure, those who can afford it add tobacco to the lime. A morbid craving for either betel nut or tobacco are sources of immense revenue to many governments. Neither reasoning nor appeals to the intelligence of chewers, who are shortening their days by an excessive indulgence, have ever had the slightest influence in convincing them that they were violating a law of organic life. Science fails to explain the cause of our intense morbid craving for vegetable narcotics so potent as tobacco and betel nut.—*New York Mail.*

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against railway rivalry. The country is silently, but steadily and surely, changing by competition to other cities of the United States and the Canadas. The great railway of Philadelphia, which compasses all drains the far west, in the stretch of its lines and the magnitude of its business, becoming a power of vast importance and terror to all competing lines, whether canals or railways, and naturally prompting desperate remedies to counteract. Hence the proposition of free canals in New York with national aid if possible, or without and by the State alone if necessary. Our proposed steamship line is important to this connection, and will prove an efficient back to the enterprise of the Pennsylvania Railroad if it is carried to successful consummation. It should not be allowed to halt. Even the New York through lines railway have failed to prevent the change now going on. In addition to our own great railroad, New York is threatened with a shorter route than its own from the west to the seaboard. A line will soon be completed from Chicago and St. Louis to Norfolk, and still another from Louisville, Cairo and St. Louis to Mobile. New Orleans is striving for the trade of the interior with the West Indies, South and Central America; and the Canadian Government has ordered the enlargement of the Welland and St. Lawrence canals. In 1860-61, before the war, the ratio of receipts at New York was 79 to 81 per cent. This during the war was scarcely maintained, and after the war declined to 50 per cent., and on the reduction of tolls in 1870 advanced to 50—a clear loss since 1860 of 29 to 30 per cent. Since 1860 the grain trade of the West has been largely diverted from its formerly accustomed route to New Orleans, Baltimore, Erie, Philadelphia, Boston, Portland and Montreal. During the last four years the grain trade of Philadelphia has been increased more than 100 per cent. Hence New York, of whom all are justly proud as a great mart of trade, is seen to be beset with rivalry, that while well justifies that city and State in their efforts to hold pre-eminence, should not be